Vol. 1071 Number 2

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

oute to:

PATENTS

October 14, 1986

U.S.
DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

October 14, 1986 Volume 1071 Number 2

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Feb. 9, 1986 and is announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

International PCT fees have been changed effective Jan. 1, 1986 and were announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

Note that the amount of the international search fee for the European Patent Office and the amounts of the International PCT fees will change effective June 1, 1986. For information on these fee changes see the notice appearing in the *Official Gazette* at 1065 O.G. 41 on Apr. 29, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
if paid before June 1, 1986	830.00
if paid on or after June 1, 1986	930.00
International fees	
Basic fee (first 30 pages):	
if paid before June 1, 1986	325.00
if paid on or after June 1, 1986	375.00
Basic Supplemental fee (for each page over 30):	
if paid before June 1, 1986	6.00
if paid on or after June 1, 1986	7.00
Designation fee for the first 10 national or regional offices:	
if paid before June 1, 1986	80.00
if paid on or after June 1, 1986	90.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Mar. 31, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Oct. 11, 1983, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,408,355 through 4,409,688
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JULY 27, 1986, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,340,982	06/246,957	7/27/82
4,340,989	06/227,318	7/27/82
4,341,008	06/220,373	7/27/82
4,341,033	06/199,111	7/27/82
4,341,034	06/252,310	7/27/82
4,341,037	06/255,889	7/27/82
4,341,040	06/222,248	7/27/82
4,341,051	06/217,695	7/27/82
4,341,060	06/230,807	7/27/82
4,341,150	06/251,111	7/27/82
4,341,203	06/271,654	7/27/82
4,341,204	06/271,655	7/27/82
4,341,211	06/300,028	7/27/82
4,341,248	06/231,541	7/27/82
4,341,285	06/221,493	7/27/82
4,341,331	06/286,797	7/27/82
4,341,375	06/260,419	7/27/82
4,341,376	06/228,751	7/27/82
4,341,384	06/236,706	7/27/82
4,341,388	06/225,872	7/27/82
4,341,451	06/251,122	7/27/82
4,341,520	06/226,408	7/27/82
4,341,521	06/238,669	7/27/82
4,341,530	06/276,610	7/27/82
4,341,539	06/215,815	7/27/82
4,341,544	06/294,466	7/27/82
4,341,576	06/269,111	7/27/82
4,341,580	06/228,997	7/27/82
4,341,591	06/252,250	7/27/82
4,341,613	06/231,266	7/27/82
4,341,649	06/243,760	7/27/82
4,341,693	06/273,799	7/27/82
4,341,697	06/264,637	7/27/82
4,341,703	06/304,727	7/27/82
4,341,708	06/230,539	7/27/82
4,341,713	06/219,772	7/27/82
4,341,719	06/238,327	7/27/82
4,341,794	06/229,860	7/27/82
4,341,799	06/220,367	7/27/82
4,341,917	06/263,806	7/27/82
4,341,920	06/224,755	7/27/82
4,341,922	06/218,968	7/27/82
4,341,948	06/230,704	7/27/82
4,341,956	06/240,242	7/27/82
4,341,986	06/227,311	7/27/82
4,341,996	06/265,475	7/27/82
4,342,024	06/228,712	7/27/82
4,342,039	06/227,863	7/27/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,111,727, Re. S.N. 887,466, Filed July 21, 1986, Cl. 149/2, WATER IN-OIL BLASTING COMPOSITION, Robert B. Clay, Owner of Record: *Inventor,* Attorney or Agent: I. William Millen, et al., Ex. Gp.: 223

4,462,569, Re. S.N. 890,930, Filed July 28, 1986, Cl. 254/8B, APPARATUS FOR JACKING UP AND SUPPORTING A STRUCTURE, Harry H. Arzouman, Owner of Record: *Safe T. Jack, Inc., Santa Fe Springs, Calif.,* Attorney or Agent: Gene W. Arant, Ex. Gp.: 323

4,507,569, Re. S.N. 881,936, Filed July 3, 1986, Cl. 307/130, ELECTRICAL CONTROL SYSTEM AND DRIVER, John E. Hess II, Owner of Record: *Conservolite, Inc., Pittsburgh, Pa.,* Attorney or Agent: Andrew J. Cornelius, et al., Ex. Gp.: 214

4,511,127, Re. S.N. 891,677, Filed Aug. 1, 1986, Cl. 269/032, HYDRAULIC-MECHANICAL CLAMPING DEVICE, Jack H. Schron, et al., Owner of Record: *Jergens, Inc., Cleveland, Ohio,* Attorney or Agent: Charles B. Gordon, et al., Ex. Gp.: 323

4,513,295, Re. S.N. 889,319, Filed July 23, 1986, Cl. 346/33 ME, METHOD AND APPARATUS FOR RECORDING MEDICAL INFORMATION ON A STRIP CHART, Flave L. Jones, et al., Owner of Record: *American Home Products, New York, N.Y.,* Attorney or Agent: Morris Relson, et al., Ex. Gp.: 216

4,529,427, Re. S.N. 868,028, Filed May 29, 1986, Cl. 65/3.12, METHOD FOR MAKING LOW-LOSS OPTICAL WAVEGUIDES ON AN INDUSTRIAL SCALE, William G. French, Owner of Record: *Bell Telephone Laboratories, Inc., Berkeley Heights, N.J.,* Attorney or Agent: S. E. Hollander, et al., Ex. Gp.: 133

4,580,369, Re. S.N. 893,389, Filed Aug. 5, 1986, Cl. 51/170R, HAND GRINDER AND VALVE THEREFORE, Keld O. Hundebol, Owner of Record: *Inventor,* Attorney or Agent: Leonard J. Robbins, et al., Ex. Gp.: 323

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Venus Industries, Inc., Chicago, Ill., Reg. No. 211,096, for the mark "VENUS AND DESIGN", and Reg. No. 585,761, for the mark "VENUS", Canc. No. 15,690.

Boyd Manufacturing, Inc., Navarre, Ohio, Reg. No. 885,761, for the mark "SCHOONER AND WAGON DESIGN", Canc. No. 15,752.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of default of such proceedings sent to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, judgment will be entered against registrant and said registration will be cancelled.

Edipsa of Miami, Inc., Miami, Fla., Reg. No. 1,233,520, for the mark "INTERNATIONAL YELLOW PAGES", Canc. No. 15,404.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

NOTICE OF CHANGES IN THE ADMINISTRATION OF 42 U.S.C. 2182 AND 2457 (PROPERTY RIGHTS STATEMENTS TO DOE AND NASA).

Effective Nov. 1, 1986, the PTO will change the procedures under which property rights statements to the Department of Energy (DOE), 42 U.S.C. 2182, or National Aeronautics and Space Administration (NASA), 42 U.S.C. 2457 are requested and processed. These statements are required before a patent can issue on any invention useful in the production or utilization of special nuclear material or atomic energy (for the Department of Energy) or having significant utility in the conduct of aeronautical and space activities (for the National Aeronautics and Space Administration).

Currently, the PTO waits until after an application is otherwise in condition for allowance before property rights statements are requested. Under the new procedure, if a statement is necessary, an informal request for the statement will be issued shortly after filing. The request will identify which chapter(s) of the statute apply and an informal period of 45 days will begin running from the mail date of the notice.

If no response is received within 45 days, a formal notice will be issued. The statutory period for response to the formal notice is 30 days. There is no provision for extension of this time limit, and the penalty for failure to file an acceptable, timely statement is abandonment. In view of these strict time limits and penalties, applicants are strongly urged to take advantage of the period for informal correspondence by responding to the so-called 45-Day Letter. Additionally, the new 45-Day Letter will provide extensive information on the format and content of an acceptable statement. This should relieve many of the difficulties applicants currently experience in generating the statement. See also 914 OG. 2 for additional information on the form and content of property rights statements.

The statement should be an accurate reflection of the ownership of the invention on which patent protection is granted. Thus, if during prosecution before the examiner the claimed invention is so changed or the property rights situation so altered as to impact the accuracy of a statement submitted earlier, a supplemental statement must be filed. In those rare situations where property rights may be changed by an amendment to the claims after the statement has been filed, applicants are reminded that failure to submit such additional information where appropriate may be considered a false representation of material facts and render the patent owner vulnerable to sanctions as set forth in the above statutes. The PTO will not review applications for this possibility. The responsibility for complying with the statutes rests with the applicants.

The text of the new 45-Day Letter is reproduced below.

* * * * *

The subject matter of this application appears to:

— be "useful in the production or utilization of special nuclear material or atomic energy " as recited in 42 U.S.C. 2181 (Department of Energy (DOE)).

— have significant utility in the conduct of aeronautical and space activities as recited in 42 U.S.C. 2457 (National Aeronautics and Space Administration (NASA)).

Accordingly, no patent can issue on this application unless applicant(s) file a statement (under oath or in the form of a declaration as provided by 37 CFR 1.68) setting forth (1) the full facts concerning the circumstances under which the invention was made and conceived and (2) the relationship (if any) of the invention to the performance of any work under any contract or other arrangement with the Agency(ies) noted above. On the reverse side of this form is an example of an acceptable format for this statement. The language appearing in paragraphs III and/or IV of the example *must* appear if applicant is attempting to establish that no relationship (under item 2 above) exists.

If the invention disclosed in this application was developed under a contract, grant or cooperative agreement between the Agency(ies) indicated above and a person, small business or nonprofit organization and rights to the invention have been determined by specific reference to 35 U.S.C. 202 in the contract, grant or cooperative agreement, then applicant need not submit the statement described above. Instead, applicant may file a verified statement (under oath or in the form of a declaration, 37 CFR 1.68) setting forth the information required by 35 U.S.C. 202(c)(6).

IF NO STATEMENT HAS BEEN RECEIVED WITHIN FORTY-FIVE DAYS OF THE MAIL DATE INDICATED ABOVE, a formal requirement for statement will then be issued. No provision is made for extension of the statutory thirty-day period for response to the formal requirement and the penalty for failure to file an acceptable and timely statement is abandonment of the application. Therefore, applicants are strongly encouraged to submit a statement at this time in order to avoid the issuance of a formal requirement.

IT IS IMPORTANT TO NOTE that the statement must accurately represent the property rights situation of the claimed invention if and when the application is found allowable. Thus, if during prosecution before the examiner, the claimed invention is so altered or the property rights situation so changed as to impact the accuracy of a statement submitted earlier, a supplemental statement must be filed. Failure to submit such additional information where appropriate may be considered as false representation of material facts and render the patent owner vulnerable

to loss of patent rights and other sanctions as set forth in the statutes. The PTO will not review allowed applications for this possibility. The responsibility for complying with the statutes rests with the applicants.

Any questions regarding this requirement should be directed to Licensing and Review at (703) 557–4948.

* * * * *

The following is an example of an acceptable property rights statement. Statements of this type are, of course, only suitable for situations in which *NO* Agency funds or other considerations were involved in the making or conception of the invention. While this example is in the form of a declaration, a sworn document is equally acceptable.

* * * * *

I (We)_____,
citizens of _____residing
at _____,
declare:

That I (we) made and conceived the invention described and claimed in patent application Serial Number _____filed in the United States of America on _____, titled
_____
_____.

(Check and complete either I. or II. below)

____I. (For Inventors Employed by an Organization)

That I (we made and conceived this invention while employed by _____
_____.

That the invention is related to the work I am (we are) employed to perform and was made within the scope of my (our) employment duties;

That the invention was made during working hours and with the use of facilities, equipment, materials, funds, information and services of (name of employer).
Other relevant facts are _____
_____
_____
_____.

That to the best of my (our) knowledge and belief (and/or based upon information provided by _____
_____
of _____):

—OR—

____II. (For Self-Employed Inventors)

that I (we) made and conceived this invention on my (our) own time using only my (our) own facilities, equipment, materials, funds, information and services.
Other relevant facts are _____
_____
_____.

That to the best of my (our) knowledge and belief:

(Check III and/or IV below as appropriate)

____III. The invention was not made or conceived in the course of, or in connection with, or under the terms of any contract, subcontract or arrangement entered into with or for the benefit of the United States Atomic Energy Commission or its successors: Energy Research and Development Administration or the Department of Energy.

—AND/OR—

____IV. The invention was not made (conceived or first actually reduced to practice) under nor is there any relationship of the invention to the performance of any work under any contract of the National Aeronautics and Space Administration.

The undersigned inventor(s) declare further that all statements made herein of his or her (their) own knowledge are true and that all statements made on information and belief are believed to be true and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Inventor's Signature:
Post Office Address:
Date:

Inventor's Signature:
Post Office Address:
Date:

* * * * *

Information regarding these changes in the processing of property rights statements may be obtained by calling or writing Mr. Kenneth L. Cage, Director, Special Laws Administration, Group 220, Washington, D.C. 20231 (703–557–2877).

Sept. 16, 1986.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Patents Available for License or Sale

General Electric Co. is prepared to grant non-exclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for licenses may be addressed to: Patent Counsel, Consumer Electronic Business Operations, General Electric Co., Portsmouth, Va. 23705.

4,371,980.	SELF ALIGNING BAND-PASS FILTERING SYSTEM.
4,375,701.	BATTERY OR AC DRIVEN RADIO RECEIVER POWER SUPPLY.
4,375,650.	SYSTEM FOR PROCESSING VIDEO SIGNALS.
4,377,870.	ELECTRONIC AUDIENCE POLLING SYSTEM.
4,380,760.	SMOKE DETECTOR WITH DELAYED ALARM AFTER CHANGE TO STAND-BY POWER.
4,381,487.	RESONATOR COUPLED DIFFERENTIAL AMPLIFIER.
4,383,007.	BATTERY COMPARTMENT.
4,383,333.	AM RADIO HAVING AN AUTOMATIC FINE TUNING CIRCUIT.
4,408,186.	POWER LINE COMMUNICATIONS OVER GROUND AND NEUTRAL CONDUCTORS OF PLURAL RESIDENTIAL BRANCH CIRCUITS.
4,409,590.	BUILDING SECURITY, COMMUNICATION AND CONTROL SYSTEM.
4,420,896.	METHOD FOR FABRICATION OF ELECTROSCOPIC DISPLAY DEVICES AND TRANSMISSIVE DISPLAY DEVICES FABRICATED THEREBY.
4,426,555.	TELEPHONE COMMUNICATIONS DEVICE FOR HEARING-IMPAIRED PERSON.

4,426,736. PROGRAMMABLE CLOCK RADIO HAVING NAP AND SLEEP TYPE FEATURES.
4,432,608. VIEWING SCREEN WITH ENHANCED CONTRAST.
4,433,326. POWER LINE COMMUNICATION SYSTEM USING THE NEUTRAL AND GROUND CONDUCTORS OF A RESIDENTIAL BRANCH CIRCUIT.
4,434,421. METHOD FOR DIGITAL DATA TRANSMISSION WITH BIT-ECHOED ARBITRATION.
4,438,519. METHOD AND APPARATUS FOR TRANSMITTING HIGH-BIT-RATE DIGITAL DATA IN POWER LINE COMMUNICATION MEDIA HAVING HIGH HARMONIC NOISE CONTENT.
4,464,793. RESONANCE SELECTION CIRCUIT FOR SERIES CONNECTION IN A RADIO RECEIVER CIRCUIT.
4,468,792. METHOD AND APPARATUS FOR DATA TRANSMISSION USING CHIRPED FREQUENCY-SHIFT-KEYING MODULATION.
4,473,837. SYSTEM FOR ENCODING AND DECODING VIDEO SIGNALS.
4,478,005. REMOVABLE INTEGRALLY MOLDED CLOSURE.
4,485,394. AUTOMATIC CONVERGENCE AND GRAY SCALE CORRECTION FOR TELEVISION RECEIVERS AND PROJECTION TELEVISION SYSTEMS.
4,495,445. BRIGHTNESS CONTROL FOR A VACUUM FLUORESCENT DISPLAY.
4,498,191. DIGITAL AUTOMATIC FREQUENCY CONTROL WITH TRACKING.
4,510,611. TRANSCEIVER CIRCUIT FOR INTERFACING BETWEEN A POWER LINE COMMUNICATION SYSTEM AND A DATA PROCESSOR.
4,510,623. TELEVISION CHANNEL LOCKOUT.
4,514,732. TECHNIQUE FOR INCREASING BATTERY LIFE IN REMOTE CONTROL TRANSMITTERS.
4,521,803. SYSTEM FOR COMPATIBLE TRANSMISSION OF HIGH-RESOLUTION TV.
4,525,703. PORTABLE SMOKE ALARM.
4,525,745. TEMPERATURE COMPENSATION FOR TV PROJECTION LENS AND CRT ASSEMBLY.
4,533,936. SYSTEM FOR ENCODING AND DECODING VIDEO SIGNALS.
4,533,960. SYSTEM FOR ENCODING AND DECODING VIDEO SIGNALS.
4,535,870. QUICK ATTACH-DETACH MECHANISM FOR AUDIO COMPONENTS.
4,542,533. TUNING SYSTEM WITH AUTOMATIC FREQUENCY CONTROL.
4,543,584. COLLAPSIBLE MAGNETIC ANTENNA MOUNT.
4,544,955. IMPLOSION RESISTANT CATHODE RAY TUBES.
4,554,426. MULTIPLE KEY WITH INVISIBLE HINGE.
4,556,857. DEFLECTION YOKE FOR SMALL GUN-BASE CRT.
4,560,941. FREQUENCY MODULATION DETECTOR USING DIGITAL SIGNAL VECTOR PROCESSING.
4,564,729. TELEPHONE ILLUMINATION CIRCUIT.
4,575,640. POWER CIRCUIT CONTROL APPARATUS FOR PRIMARY AND AUXILIARY LOADS.
4,578,653. FREQUENCY SELECTIVE FILTER CIRCUIT.
4,580,754. APPARATUS FOR MOUNTING AN APPLIANCE UNDER A CABINET OR THE LIKE.
4,583,115. CIRCUIT FOR AND METHOD OF BROADBAND COMB FILTERING A COMPOSITE VIDEO SIGNAL WHICH HAS BEEN DOUBLE-SIDE BAND DETECTED.
4,583,232. CARRIER CURRENT DIGITAL DATA TRANSCEIVER.
4,586,087. CATHODE RAY TUBE MOUNTING SYSTEM.

Applications for license may be addressed to Counsel Patent and Legal Operation, Corporate Research and Development, General Electric Co., P.O. Box 8, Bldg. K–1, Rm. 4A70, Schenectady, N.Y. 12301.

4,522,065. REMOTE PRESSURE SENSOR.
4,559,790. APPARATUS FOR MAINTAINING ELECTRONIC EQUIPMENT AND THE LIKE AT LOW TEMPERATURES IN HOT AMBIENT ENVIRONMENTS.
4,563,337. METHOD AND APPARATUS FOR CONTINUOUS ION EXCHANGE.

Applications for license should be addressed to Patent Counsel-SSD, General Electric Co., P.O. Box 8555, Philadelphia, Pa. 19101.

4,575,493. LOW EXPANSION, MULTIBAND TRANSMITTING GLASSES AND GLASS-CERAMICS.
4,575,679. AUTOMATIC LOAD SHED CONTROL FOR SPACECRAFT POWER SYSTEM.
4,576,770. METHOD OF MANUFACTURING A TURBOMACHINERY ROTOR.
4,580,922. VERTEX FITTINGS DERIVED FROM A MASTER FITTING.

3,746,823. ELECTRONIC COOKING APPLIANCE. *Robert O. Vidas, Esq.*, 2925 Multifoods Tower, 33 S. Sixth St., Minneapolis, Minn. 55402.
4,052,771. CUFF-LINKING DEVICE. *William E. Shull*, c/o Butler & Binion, 1600 Allied Bank Plz., Houston, Tex. 77002.
4,231,061. INSTANT COLOR SLIDE RECORDER OF CRT IMAGE. *Samuel Freeman*, 13 Birchwood Ct. East, Syosset, N.Y. 11791.
4,367,586. DUSTLESS CUTTER. *Edwin E. Greigg, Esq.*, 1201 S. Eads St., Suite 100, Arlington, Va. 22202.
4,377,925. BRACKET FOR CONDUIT TRENCHES ABLE, INC. *Walter J. Monacelli*, P.O. Box 13107, St. Petersburg, Fla. 33733–3107.
4,588,863. SYSTEM FOR FACILITATING PROFESSIONAL TELEPHONE COMMUNICATION. *James M. Ress*, 5300 27th St., North Arlington, Va. 22207.
SN. 06,239,501. STEN-ALL. *William Ruckstein*, 140 Gardenia La., Port Richey, Fla. 33568.
SN. 06,690,888. ROTARY INTERNAL COMBUSTION ENGINE. *Joseph F. Frasca*, 5801 Yorktown Rd., Lorain, Ohio 44053.
Des. 253,382. COMBINED HANGING PLANTER AND LIGHTS THEREFOR. *Anthony J. Spruiel*, 1210 34th St., Newport News, Va. 23607.

• *PTO Entering of Attorney Docket Number on Missing Part/Incomplete Notices*

In response to several requests from patent attorneys, the PTO is now entering the attorney docket number on the Notice of Incomplete Application and Notice to File Missing Parts of Application.

The attorney docket number which will be entered on the Notice will be that which was submitted on the transmittal letter as filed with a new patent application. The number must be clearly identified as an

"attorney docket number". This number will be entered by the PTO under the Title of Invention on the Notices.

If the Office makes a mistake in recording the attorney docket number on the Notice of Incomplete Application or the Notice to File Missing Parts of Application, such mistake is not to be used by the attorney as cause for delay in response. Nor is the attorney to request that the Office correct the docket number prior to response to the Notice. The attorney can notify the Office in the response, but no change will be made by the Office until the Filing Receipt is issued.

If the attorney wishes to change the attorney docket number from that which was entered on transmittal letter as filed, the request must be submitted through amendment, submitted to the Patent Examining Corps.

Sept. 18, 1986.

THERESA A. BRELSFORD,
Assistant Commissioner
for Administration.

PATENT NOTICES

Certificates of Correction for the Week of Oct. 14, 1986

Re. 31,903	4,557,380	4,586,523	4,597,457
Re. 32,145	4,558,898	4,586,542	4,597,765
Re. 32,191	4,562,265	4,586,653	4,597,826
D. 283,137	4,562,659	4,586,982	4,597,906
D. 284,899	4,563,082	4,587,046	4,597,947
4,154,994	4,564,133	4,587,303	4,598,108
4,390,872	4,565,881	4,588,112	4,598,381
4,401,677	4,566,654	4,588,457	4,598,579
4,424,189	4,566,871	4,588,681	4,598,666
4,425,642	4,568,471	4,588,690	4,598,818
4,434,226	4,568,675	4,588,820	4,599,108
4,442,727	4,571,437	4,588,849	4,599,190
4,453,725	4,573,780	4,588,851	4,599,438
4,458,293	4,573,995	4,589,181	4,599,538
4,465,230	4,574,153	4,589,569	4,599,567
4,466,046	4,574,925	4,590,097	4,599,863
4,467,801	4,575,525	4,590,677	4,600,029
4,468,246	4,576,606	4,590,765	4,600,073
4,469,993	4,576,666	4,591,669	4,600,257
4,474,964	4,576,728	4,591,925	4,600,636
4,479,172	4,576,917	4,592,232	4,600,648
4,489,306	4,577,425	4,592,307	4,600,844
4,490,374	4,578,195	4,592,679	4,600,947
4,495,262	4,579,888	4,592,916	4,601,229
4,495,589	4,580,876	4,593,391	4,601,317
4,496,555	4,581,359	4,593,937	4,602,023
4,505,302	4,581,370	4,594,076	4,602,273
4,505,441	4,581,502	4,594,414	4,602,670
4,512,184	4,582,043	4,594,458	4,603,019
4,513,976	4,582,613	4,594,581	4,603,038
4,515,704	4,583,396	4,594,815	4,603,305
4,515,962	4,583,806	4,595,040	4,603,368
4,528,772	4,583,891	4,595,071	4,603,554
4,528,927	4,584,003	4,595,176	4,603,910
4,530,882	4,584,282	4,595,302	4,604,042
4,532,873	4,584,438	4,595,479	4,604,401
4,534,926	4,585,038	4,595,531	4,604,467
4,540,792	4,585,145	4,595,632	4,604,478
4,543,261	4,585,435	4,595,742	4,604,486
4,546,768	4,585,464	4,595,807	4,605,325
4,549,030	4,585,571	4,595,955	4,605,691
4,550,812	4,585,652	4,596,100	4,605,709
4,551,353	4,586,108	4,596,561	
4,551,682	4,586,416	4,596,863	
4,554,271	4,586,430	4,597,212	

Disclaimers

3,978,645.—*George H. Bennett,* Berrien Springs, Mich.; and *Wilbur L. Pringle,* Washington, Ill. SICKLE GUARD. Patent dated Sept. 7, 1976. Disclaimer filed July 9, 1986, by the assignee, *National Standard Co.*

Hereby enters this disclaimer to claims 1, 4, 5, 7 and 8 of said patent.

4,167,585.—*Andrew A. Caridis,* Foster City and *Clark K. Benson,* Millbrae, Calif. METHOD FOR HEATING AND COOKING FOOD IN A CLOSED TREATMENT CHAMBER BY MAINTAINING THE TEMPERATURE AND MOISTURE CONTENT. Patent dated Sept. 11, 1979. Disclaimer filed June 6, 1986, by the assignee, *Heat and Control, Inc.*

Hereby enters this disclaimer to claim 9 of said patent.

4,186,786.—*George F. Kirkpatrick,* Downers Grove, Ill. COLORED INTERLOCKING CLOSURE STRIPS FOR A CONTAINER. Patent dated Feb. 5, 1980. Disclaimer filed Apr. 2, 1986, by the assignee, *Union Carbide Corp.*

Hereby enters this disclaimer to all claims of said patent.

Dedications

4,050,042.—*Albert M. Anthony,* Bangor, Mich. STATIC CONVERGENCE DEVICES FOR COLOR TELEVISION PICTURE TUBES. Patent dated Sept. 20, 1977. Dedication filed May 7, 1980, by the assignee, *Tractor, Inc.*

Hereby dedicates the entire term of said patent to the Public.

4,490,165.—*David M. Spatz, Trenton and Barrington Cress,* Rocky Hill, N.J. META-(PHENYLALKOXY)PHENYL-N-METHOXY-N-METHYLUREA COMPOUNDS, METHODS FOR PREPARING SAME AND HERBICIDAL USE THEREOF. Patent dated Dec. 25, 1984. Dedication filed June 26, 1986, by the assignee, *American Cyanamid Co.*

Hereby dedicates to the Public the entire remaining term of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7609
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Irvine: University of California, Irvine Library	(714) 856-7234
	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Connecticut	New Haven: Science Park Library	(203) 786-5000
Delaware	Newark: University of Delaware Library	(302) 451-2965
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
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Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
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Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1227
	The Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas.	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
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Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF September 13, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-21-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-24-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-01-85
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	3-08-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	10-09-84
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	4-11-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	11-21-83
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	4-25-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	11-09-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-17-84
DESIGN, GROUP 290—K. L. CAGE, Director	4-02-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	2-19-85
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	12-24-84
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	5-21-84
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	2-25-85
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	1-02-86

Expiration of patents: The patents within the range of numbers indicated below expire during September 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,464,063 to 3,470,563, inclusive

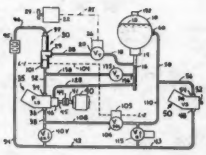
Plant Patents ..... Numbers 2,918 to 2,926 inclusive

REEXAMINATIONS

OCTOBER 14, 1986

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,449,911 (580th)
POWER TRANSFER SYSTEM
Paul W. Schlosser, Chicago, Ill., assignor to Muncie Power Products, Inc., Muncie, Ind.
Reexamination Request No. 90/000,806, Jun. 19, 1985.
Reexamination Certificate for Patent No. 3,449,911, issued Jun. 17, 1969, Ser. No. 577,552, Sep. 6, 1966.
Int. Cl.[4] F16D *31/02*; F15B *21/04*; F04B *21/00*
U.S. Cl. 60—453



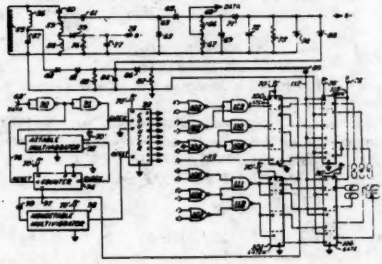
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **3** and **4** is confirmed.

Claims **1**, **2**, and **5–12** are cancelled.

3. Apparatus generally as forth in claim **1**, including power limiting means for said system, comprising a pressurized liquid operated shut-off valve further controlling the supply of liquid to said pump in response to the pressure of liquid delivered from same, and means controlled by said shut-off valve for reducing the pressure of liquid delivered by said pump.

B1 4,019,518 (581st)
ELECTRICAL STIMULATION SYSTEM
Donald D. Maurer, Anoka, and Paul D. Sorenson, Blaine, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.
Reexamination Request No. 90/000,376, May 9, 1983.
Reexamination Certificate for Patent No. 4,019,518, issued Apr. 26, 1977, Ser. No. 603,434, Aug. 11, 1975.
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 R

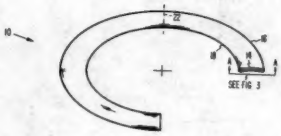


AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–34** are cancelled.

[1. In an electrical stimulation system for selectively stimulating portions of the body of the type having external means for transmitting stimulus signals and control signals, implantable means for receiving said transmitted signals, a plurality of output means adapted to apply said stimulus signals to the body and means interconnecting said receiving means and said output means and responsive to said control signals for routing said stimulus signals to said output means, the improvement wherein: said output means are adapted for combination in a plurality of preselected configurations: said transmitting means includes means for alterably preselecting a predetermined characteristic of each control signal, said predetermined characteristic manifesting a desired one of said output means configurations; and said routing means comprises means for selectively routing said stimulus signals to the desired output means configuration in accordance with the predetermined characteristic of said control signals.**]**

B1 4,104,822 (582nd)
ROTATING CIRCULAR AIRFOIL
Henry W. Rodgers, 9725 W. 21st Ave., Lakewood, Colo. 80215
Reexamination Request No. 90/000,352, Mar. 31, 1983.
Reexamination Certificate for Patent No. 4,104,822, issued Aug. 8, 1978, Ser. No. 747,310, Dec. 3, 1976.
Int. Cl.[4] A63H *27/00*
U.S. Cl. 446—48



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **2**, **4**, **6–11** and **14** is confirmed.

Claims **1**, **3**, **5**, **12** and **13** are cancelled.

New claims **15–24** are added and determined to be patentable.

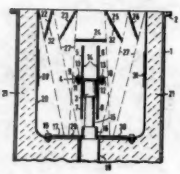
15. A rotating circular ring airfoil body for use as a flying toy, which airfoil body is defined by an outer circumferential edge and an inner circumferential edge and an upper camber surface and a bottom camber surface, said edges and surfaces defining an airfoil profile in cross section radially through said airfoil body, said airfoil profile being of uniform cross sectional configuration circumferentially around said airfoil body, said airfoil profile being further defined with respect to a reference chord line extending across said profile from said outer circumferential edge to said inner circumferential edge, said upper camber surface is located above said chord line and has a maximum height above said chord line at approximately equal distance between said outer circumferential edge and said inner circumferential edge, said bottom camber surface is located below and extends generally parallel with respect to said chord line, said upper camber surface has a first curvature from said maximum height to said outer circumferential edge and a second curvature from said maximum height to said inner circumferential edge, and said first and second curvatures are substantially identical to one another and symmetrical

about a reference line perpendicular to said chord line and passing through a midpoint of said chord line.

B1 4,121,430 (583rd)
CRYOPUMP HAVING IMPROVED HEAT RADIATION SHIELDING

Werner Bächler, Hoffnungsthal; Hans-Joachim Forth, and Rudiger Frank, both of Cologne, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH & Co. KG, Cologne, Fed. Rep. of Germany

Reexamination Request No. 90/000,642, Oct. 2, 1984.
Reexamination Certificate for Patent No. 4,121,430, issued Oct. 24, 1978, Ser. No. 793,488, May 4, 1977.
Claims priority, application Fed. Rep. of Germany, May 11, 1976, 2620880
Int. Cl.[4] B01D *8/00*
U.S. Cl. 62—55.5



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **5–8** is confirmed.

Claims **1–4** and **9** are cancelled.

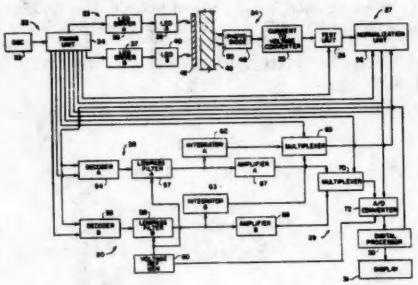
New claim **10** is added and determined to be patentable.

10. In a cryopump composed of a housing presenting an entrance opening defined by a plane for passage of molecules of a gas to be pumped, a member arranged to be brought to low temperature and presenting planar condensation surfaces for molecules of the gas to be pumped, and a thermal radiation shield disposed in the region of the entrance opening, the improvement wherein said member is positioned so that said condensation surfaces are substantially at right angles to the plane of the entrance opening, and said radiation shield comprises a plurality of elongated metal strips so positioned that their longitudinal axes are parallel to the condensation surfaces, further wherein said member comprises two plates which face one another and extend through the pump housing, the surfaces of said plates which face away from one another constituting said condensation surfaces, and said member further comprising adsorption material covering only the surfaces of said plates which face one another, and further wherein the surfaces of said plates which face away from one another are arranged to be more accessible to molecules of gas entering the cryopump through said entrance opening than the surfaces of said plates which face one another.

B1 4,407,290 (584th)
BLOOD CONSTITUENT MEASURING DEVICE AND METHOD

Scott A. Wilber, Boulder, Colo., assignor to Biox Technology, Inc., Boulder, Colo.

Reexamination Request No. 90/000,794, Jun. 10, 1985.
Reexamination Certificate for Patent No. 4,407,290, issued Oct. 4, 1983, Ser. No. 250,956, Apr. 1, 1981.
Int. Cl.[4] G01N *33/16;* **A61B** *5/00*
U.S. Cl. 128—633



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–6**, **10–16** and **18–33** is confirmed.

Claims **7–9**, **17** and **34–36** are cancelled.

1. A blood constituent measuring device, comprising:
electromagnetic energy emitting means for emitting electromagnetic energy at a plurality of predetermined wavelengths through a blood-containing sample at a test area;
sensing means for receiving electromagnetic energy from said sample at said plurality of wavelengths;
signal producing means connected with said sensing means to produce output signals responsive to electromagnetic energy received by said sensing means at said plurality of wavelengths;
normalizing means for receiving said output signals from said signal producing means and scaling the same so that the DC components are normalized; and
processing means for receiving said output signals from said normalizing means and producing an output indicative of changes in the thickness of preselected constituents of blood relative to the total change in blood thickness.

B1 4,494,365 (585th)
MOWER CUTTING UNIT

Lawrence L. Lloyd, 1001 Olmstead Ave., Pacific Grove, Calif. 93950

Reexamination Request No. 90/000,912, Nov. 25, 1985.
Reexamination Certificate for Patent No. 4,494,365, issued Jan. 22, 1985, Ser. No. 545,971, Oct. 26, 1983.
Int. Cl.[4] A01D *34/53, 34/42*
U.S. Cl. 56—256

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **23** is confirmed.

Claim **5** is cancelled.

Claims **1**, **2** and **6** are determined to be patentable as amended.

Claims 3, 4 and 7-22, dependent on an amended claim, are determined to be patentable.

New claim 24 is added and determined to be patentable.

1. A mower cutting unit of the type including a mower blade mounted for rotation to a frame and support members mounted to the frame which support the cutting unit on a mowing surface, the improvement comprising:

a supplementary cutter including a plurality of cutting edges spaced apart in a predetermined axial pattern;

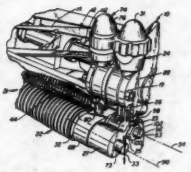
one said support member comprising a generally horizontal slotted expunger roller mounted to the frame for rotation about an expunger roller axis, an outer expunger roller surface and a plurality of vertically disposed annular slots located in [a] *the* predetermined axial pattern along said expunger roller, said slots dividing said expunger roller surface into a plurality of expunger roller surface segments;

[a supplementary cutter;]

means for mounting said supplementary cutter adjacent and behind said expunger roller *with the cutting edges passing within the annular slots*; and

means for actuating said supplementary cutter;

whereby horizontally disposed plant matter is [pulled]



raised up into said circular slots as said expunger roller surface segments roll over said plant matter to allow said supplementary cutter to cut said [pulled] *raised* up plant matter *while leaving the mower surface substantially undamaged.*

REISSUES

OCTOBER 14, 1986

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,264
DOUBLE TORIC SEALING RING

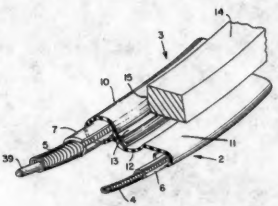
Maurice Bonafous, Oloron, France, assignor to Applications Mechaniques et Robinetterie Industrielle (AMRI S.A.), France

Original No. 4,415,170, dated Nov. 15, 1983, Ser. No. 337,279, Jan. 5, 1982. Application for reissue Nov. 6, 1985, Ser. No. 795,646

Claims priority, application France, Jan. 13, 1981, 81 00460

Int. Cl.[4] F16J *15/12, 15/32*

U.S. Cl. 277—163 **10 Claims**



1. A flexible double toric sealing ring comprising first and second sealing ring structures **2, 3**, positioned about a common concentric axis, which ensure respectively a static seal and a dynamic seal, a counter ring which absorbs the compressive forces at the valve seat and also distributes contact pressure along the circumference, said counter ring movably mounted around the second sealing ring structure to allow self-centering of the sealing ring structure on the valve seat, and a sealing membrane, having an elastically deformable part, which interconnects the two sealing ring structures while partially covering them, said double toric sealing ring being characterized by said sealing membrane having one lateral side facing in a first direction along said common concentric axis and having an opposite lateral side facing in a second direction, opposite said first direction, along said common concentric axis, and by the placement of the two sealing ring structures on opposite lateral sides of the middle section of the membrane.

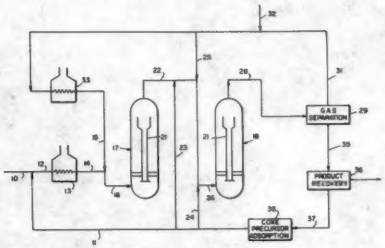
Re. 32,265
HYDROGENATION OF HIGH BOILING HYDROCARBONS

Harold Unger, Fort Lee, N.J.; Morgan C. Sze, Portsmouth, N.H., and Roger P. Van Dreisen, Titusville, N.J., assignors to Lummus Crest, Inc., Bloomfield, N.J.

Original No. 4,411,768, dated Oct. 25, 1983, Ser. No. 370,416, Apr. 21, 1982. Continuation-in-part of Ser. No. 272,720, Jun. 11, 1981, abandoned, which is a continuation of Ser. No. 106,274, Dec. 21, 1979, abandoned. Application for reissue May 17, 1985, Ser. No. 735,101

Int. Cl. C10G *47/26, 47/36*

U.S. Cl. 208—59 **10 Claims**



1. In a process for upgrading high boiling hydrocarbon materials to valuable lower boiling materials is a hydrogenation operation including at least one expanded bed catalytic hydrogenation zone to produce an upgraded hydrogenated product, the improvement comprising:

recovering from the upgraded hydrogenation product a recycle liquid having a 5-volume percent distillation temperature of at least 450° F. with at least 25 -volume percent thereof boiling above 950°F.; cooling the liquid recycle to a temperature of at least 350° F. and no greater than 700° F. to [separate precipitate coke precursors; removing] *essentially only* coke precursors from the *cooled* liquid recycle; and subsequent to [separation removal] *of said coke* precursors providing the liquid recycle to an expanded bed catalytic hydrogenation zone.

PATENTS

GRANTED OCT. 14, 1986

ERRATA

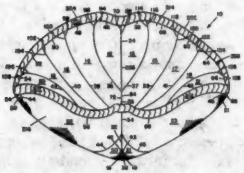
For CLASS	See PATENT NO.
187–029	4,616,733
384–007	4,616,881
384–015	4,616,885
384–045	4,616,886
420–117	4,617,052
530–324	4,617,149
540–364	4,617,150
540–001	4,617,151
540–200	4,617,152
558–450	4,617,154

PATENTS

GRANTED OCTOBER 14, 1986

GENERAL AND MECHANICAL

4,616,365
WRAP
Shirley Lyons, 11064 N. 300 W., Huntington, Ind. 46750
Filed Apr. 15, 1985, Ser. No. 723,621
Int. Cl.[4] A41B *13/06*
U.S. Cl. 2—69 **18 Claims**



1. A wrap comprising a plurality of segments of relatively flexible planar material, said segments being joined together by lengthwise connectors, said wrap having a substantially three-dimensional conchiform or clamshell shape when said wrap is not being worn and is supported in generally wrinkle and fold free configuration, said segments being joined together as bilaterally arranged pairs, and said segments comprising top, middle and bottom segment pairs, each pair being dissimilar in shape form the other pairs.

13. A pattern for a wrap, said pattern comprising planar material having indicia of a plurality of segments, said segments having outer borders, central borders, and lateral borders, said segments being reproducable in relatively flexible planar material wherein respective pairs of said central borders and respective pairs of said lateral borders are joinable to concatenate said segments and form said wrap, said wrap having a substantially conchiform or clam shell three-dimensional shape when said wrap is supported in wrinkle and fold free configuration.

4,616,366
PLACKET
George B. Mueller, 3540 Chalet, Crete, Ill. 60417
Filed Dec. 24, 1984, Ser. No. 686,134
Int. Cl.[4] A41B *1/00*
U.S. Cl. 2—115 **9 Claims**

1. A shirt, comprising:

a right front side marginal edge having an upper right portion extending from a collar portion to a breast portion and a lower right portion extending from the breast portion to a waist portion;

a left front side marginal edge having an upper left portion extending from the collar portion to the breast portion and a lower left portion extending from the breast portion to the waist portion;

the upper right portion and upper left portion being separable to enable a wearer to don the shirt by slipping the shirt over the user's head, and closeable to enable a user to draw the upper right portion and upper left portion together for buttoning once the shirt is donned; and

the lower right portion and lower left portion overlapping along a central line extending from the breast portion to the waist portion;

a placket extending along one of the upper right portion and the upper left portion, from the collar portion to the breast portion, and continuously from the breast portion along the center line to the waist portion, the placket having a series of spaced-apart buttonholes along substantially its entire length, the series of buttonholes including an upper group of buttonholes between the collar portion and the breast portion and a lower group of buttonholes between the breast portion and the waist portion;

a series of spaced-apart buttons corresponding to the buttonholes, the series of buttons including an upper group of buttons for engagement with the upper group of buttonholes and a lower group of buttons located at corresponding ones of the lower group of buttonholes;

placket stitching means for attaching the overlapping lower right and lower left portions together along the central line, and for attaching the placket to the lower right and lower left portions;

upper button stitching means for attaching the upper group of buttons;

lower button stitching means for attaching the lower group of buttons to the shirt, the lower button stitching means extending through the lower group of buttonholes; and

traverse stop stitching means for reinforced attachment of the placket to the lower right and lower left portions along a stress line extending traversely to the central line at the breast portion;

wherein the lower right and lower left portions are permanently attached together to prevent undesired separation, while providing the appearance of a conventional front-buttoned dress shirt.

4,616,367
HEADBAND WITH DETACHABLE LENSES
Joseph A. Jean, Jr., 1631 E. Grove Pl., Fullerton, Calif. 92631, and Lynne Laurence, 1020 Riverside Dr., #46, Burbank, Calif. 91506
Filed Nov. 14, 1984, Ser. No. 671,479
Int. Cl.[4] A61F *9/02*
U.S. Cl. 2—452 **6 Claims**

1. An article comprising, in combination:

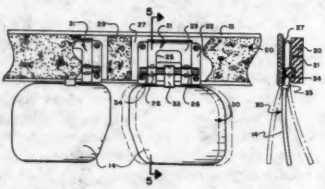
a headband adapted to encircle the head of a user;

a strip of moisture-absorbing material secured to one side of said headband;

a pair of clips positioned in parallel, spaced relationship and retained between said headband and said moisture-absorbing material strip, with the open ends of said clips extending transverse to the longitudinal dimension of said headband; and

a pair of lenses, each of said lenses including an elongate member extending parallel to the top edge thereof and

means for interconnecting each of said lenses and the corresponding one of said members, said clips being adapted to independently receive said members of said



lenses, said lenses being adjustable relative to said clips both laterally and angularly about the axes of said elongate members.

4,616,368

SANITARY CLEANING APPARATUS

Kazutoshi Nagai, Nara, and Hirofumi Aoyagi, Habikino, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 25, 1985, Ser. No. 748,668

Claims priority, application Japan, Jun. 29, 1984, 59-135642

Int. Cl.[4] A47K *3/20, 4/00;* **E03D** *9/00, 9/081*

U.S. Cl. 4—420.2 **8 Claims**

1. A sanitary cleaning apparatus comprising a first functional means which discharges cleaning water to object parts, a second functional means which has a function identical to or different from the first functional means, and latch circuit means including first switching means switchable between a first state for turning on the first functional means and a second state for turning off the first functional means, second switching means switchable between a first state for turning on the second functional means and a second state for turning off the second functional means, and human body detector means for detecting the presence or absence of a human body, wherein the latch circuit means permits operation of a selected one of said first and second functional means only when the switching means for the selected functional means is placed in the first state in combination with detection of the presence of a human body by the human body detector means, and wherein the latch circuit prohibits operation of the selected functional means when said switching means for the other of said functional means is placed in the first state, said switching means for said selected functional means is placed in the second state, or the human body detector means setects the absence of a human body, the latch circuit means prohibiting the operation of the selected first or second functional means by placing the switching means for the selected functional means in the second state.

4,616,369

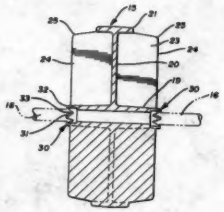
AQUATIC TURBULENCE SUPPRESSION DEVICE

Thomas P. Rademacher, Medina, Ohio, assignor to McNeil Corporation, Akron, Ohio

Filed May 28, 1985, Ser. No. 738,294

Int. Cl.[4] E04H *3/16*

U.S. Cl. 4—497 **18 Claims**



1. A device for use in a body of water as one of a plurality of such devices assembled in axial alignment with one another along a restraining element to suppress incident wave turbulence, said devices comprising, hub means adapted to receive the restraining element, a plurality of planar vane means for directing incident water extending generally radially and axially of said hub means, annular baffle means disposed proximate the radial extremity of said vane means, web means for suppressing wave turbulence extending radially of said hub means and oriented substantially perpendicular to said vane means, and interlocking means on said hub means matingly engaging opposed interlocking means of adjacent devices for precluding relative rotation between adjacent of such devices assembled along the restraining element, said interlocking means being a sawtooth configuration positioned on the axial extremity of said hub means.

4,616,370

FURNITURE

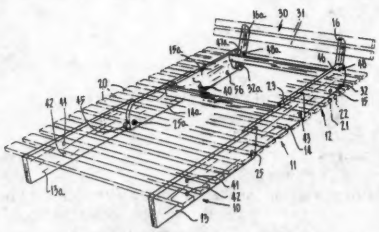
Phillip R. Keenan, and Anthony F. Keenan, both of 48 Ethel Street, East Brunswick, Victoria 3057, Australia

Filed Dec. 12, 1984, Ser. No. 680,803

Claims priority, application Australia, Dec. 13, 1983, PG2820/83

Int. Cl.[4] A47B *83/00;* **A47D** *11/00*

U.S. Cl. 5—2 R **5 Claims**



1. In an article of furniture convertible into a bed, lounge, chair, or table, said article having interconnected intermediate and first and second end panels, each of which has a pair of spaced longitudinal members which are connected by a plurality of transverse slots, said first end panel being pivotally connected to one end of said intermediate panel by pivot means, said second end panel connected to the other end of said intermediate panel by hinge means connected between the transverse slats at the adjacent ends of said panels, said article being constructed and arranged so that said panels can be located in

different angular positions relative to each other to form said bed, lounge, chair, or table, the improvement comprising:

said spaced members of said intermediate panel are transversely located within and closely adjacent to the spaced members of said first end panel and said spaced members of said second end panel are transversely located within and closely adjacent to the spaced members of said intermediate panel;

said panels are adapted to be arranged in a horizontal position engaging a floor wherein said slats are in the same plane to form a horizontal upper surface for said bed, said first end panel being a foot panel and said second end panel being a head panel of said bed;

when said article is configured as a lounge, said foot panel and said intermediate panel are adapted to be arranged in a horizontal position on said floor and said head panel is rotated about said hinge means to an upstanding position relative to said horizontal panels, said head panel being adjustably lockable in a desired angular position by lock means connected between the adjacent spaced longitudinal members of said head and intermediate panels;

when said article is configured as a chair, said foot panel is rotated about said pivot means so that the slats on said foot panel are substantially horizontal and facing downward to engage said floor and said intermediate panel is adapted to be arranged above said foot panel and the slats of said intermediate panel form a substantially horizontal upper seat surface of said chair, and said head panel is rotated about said hinge means to an upstanding position relative to said intermediate panel, said head panel being adjustable to a desired angular position wherein it is fixed by said lock means; and

when said article is configured as a table, said head panel is adapted to be arranged in a horizontal position on said floor wherein the slats of said head panel form a horizontal upper surface above said floor, said intermediate panel is rotated on said hinge means so that the slats on said intermediate panel are positioned above and engaged downwardly against said upper surface, and said foot panel is rotated about said pivot means so that the slats on said foot panel are positioned above said head and intermediate panels to form a substantially horizontal upper surface for said table.

4,616,371

BED FOR BABY CARRIAGES

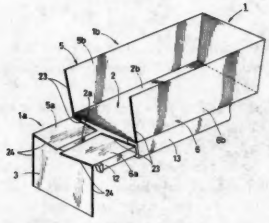
Kenzou Kassai, Osaka, Japan, assignor to Aprica Kassai Kabushikikaisha, Osaka, Japan

Division of Ser. No. 583,130, Feb. 24, 1984, abandoned. This application Sep. 25, 1985, Ser. No. 781,192

Claims priority, application Japan, Mar. 2, 1983, 58-35000

Int. Cl.⁴ B62B *9/12*; A47D *7/01*

U.S. Cl. 5—99 A **1 Claim**



1. A bed for baby carriages which is in the form of a box as a whole comprising a bottom wall (2), a front wall (3), a back wall (4), and left-hand and right-hand walls (5,6), wherein longitudinally slidable draw links (12) are provided on both sides under the bottom wall (2) so that when the draw links (12) are forwardly withdrawn, they hold front portions (2*a*, 5*a*, 6*a*) of the bottom wall (2) and left-hand and right-hand side walls (5, 6) and the front wall (3), means for separating said front portions (5*a*, 6*a*) of the left-hand and right-hand side walls (5, 6) from their respective rear portions (5*b*, 6*b*), wherein said front portions (2*a*) of the bottom wall (2) are displaceable with respect to the rear portion (2*b*), means arranged so that when the draw links (12) are rearwardly retracted, the front portions (2*a*, 5*a*, 6*a*) of the bottom wall (2) and left-hand and right-hand side walls (5, 6) and the front wall (3) are displaced in such a manner as to open the front of the baby carriage bed to enable the bed to be used as a chair, wherein said front and rear portions (2*a*, 2*b*) of the bottom wall (2) are formed of separate members disposed on different levels, said front portion (2*a*) being attached to said draw links (12), so that when the draw links (12) are rearwardly retracted, the front and rear portions (2*a*, 2*b*) slide in a mutually overlapping relation, wherein said front wall (3) is constructed to be separable from the left-hand and right-hand side walls (5, 6), said front wall being foldable along a boundary line between the front wall (3) and the bottom wall (2), wherein said front portion (2*a*) of the bottom wall (2) lies below the plane of said rear portion (2*b*), and comprising means for folding said front portions (5*a*, 6*a*) of the left-hand and right-hand side walls (5, 6) along a boundary line between said side walls and the front portion (2*a*) of the bottom wall (2), so that when the draw links (12) are rearwardly retracted, the front portions (5*a*, 6*a*) of the left-hand and right-hand side walls (5,6), which are now folded on the front portion (2*a*) of the bottom wall (2), are received under the rear portion (2*b*) of the bottom wall (2).

4,616,372

METHOD OF OPERATING COUNTER FLOW CYCLING WASHING MACHINE

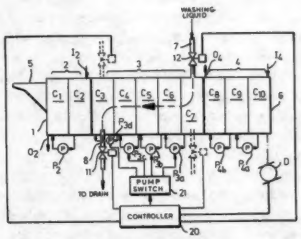
Karl-Heinz Stoll, Wiesbaden, Fed. Rep. of Germany, assignor to Senkingwerk GmbH, Hildesheim, Fed. Rep. of Germany

Division of Ser. No. 672,582, Nov. 16, 1984. This application Jan. 15, 1986, Ser. No. 819,135

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1983, 3341504

Int. Cl.⁴ D06F *31/00*

U.S. Cl. 8—158 **1 Claim**



1. A method of operating a counterflow continuous washing machine which comprises the steps of:

(a) introducing successive batches of laundry into an inlet end of a washing trommel rotatable about a longitudinal axis and axially subdivided into a multiplicity of compartments in respective groups forming washing zones including a main washing zone;

(b) angularly oscillating said trommel to agitate each batch within a respective compartment in a treating liquid and thereafter rotating said trommel to transfer each batch to an adjacent compartment in a laundry-displacement direction;

(c) pumping treating liquid from compartment to compartment in the opposite direction along at least said main washing zone;

(d) introducing the treating liquid of step (c) at a down-

stream end of said main washing zone and removing the treating liquid of step (c) at an upstream end of said main washing zone in said laundry-displacement direction; and

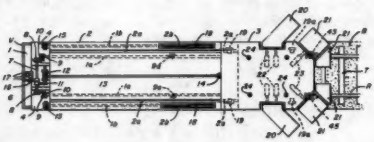
(e) upon the passage of colored laundry into said main washing zone, terminating the pumping in step (c) and interrupting step (d) while introducing a treating liquid into said main washing zone at said upstream end and removing treating liquid at said downstream end.

4,616,373

LOADING AND UNLOADING RAMP UNIT FOR RAILWAY CONVOY TRAIN

Juan J. B. Perez, Madrid, Spain, assignor to Jefatura de Ingenieros del Ejercito, Madrid, Spain

Filed Nov. 30, 1983, Ser. No. 556,543
Claims priority, application Spain, Nov. 30, 1982, 517,837
Int. Cl.[4] E01D *1/00, 15/12*
U.S. Cl. 14—72.5 **7 Claims**



1. A loading ramp system for railway flat cars and the like comprising a generally stationary base portion mounted on said flat car, guide means mounted on said base extending generally longitudinally thereof, an extendable ramp movably supported on said guide means and said base for longitudinal displacement between extended and retracted positions including pivot means carried by said ramp configured to permit said ramp to swing angularly downwardly when in an extended position to angularly engage a surface therebeneath, a platform carried by said ramp in stacked relation and extensible relative thereto along said surface to define a generally parallel transitional surface overlying the rail bed when in extended relation with respect to said ramp, said platform including at least one pivotally attached apron movable between a folded and an extended position laterally of the platform, said apron carried by and angularly related to the plaform when extended to define bridge means for loading and unloading cargo from said flat car, said ramp, and said platform onto said apron and thereby to and from a position displaced laterally from said railway bed to avoid damage thereto during loading and unloading operations.

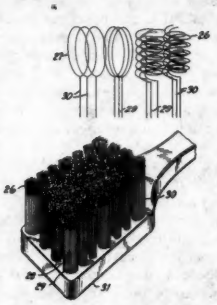
4,616,374

MICROFLOSS TOOTHBRUSH

William Novogrodsky, 901 SW. 70th Ave., Plantation, Fla. 33317

Division of Ser. No. 511,889, Jul. 8, 1983, abandoned. This application May 28, 1985, Ser. No. 738,570
Int. Cl.[4] A46B *9/04*
U.S. Cl. 15—167 R **6 Claims**

1. A microfloss dental brush head comprised of filaments perpendicularly affixed to a shaft wherein a portion of each of said filaments nearest the shaft is linear and the remaining



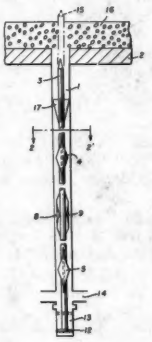
portion of each of said filaments is circularly formed in a closed loop.

4,616,375

CLEANING DEVICE FOR JET PIPES IN TiO_2 REACTOR

Frank Green, Gulfport, Miss., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 13, 1984, Ser. No. 670,973
Int. Cl.[4] B08B *9/02*
U.S. Cl. 15—246 **1 Claim**



1. A device for cleaning a chlorine jet pipe in a chlorine process fluid bed reactor for producing titanium dioxide comprising

(a) a central shaft fitted within the pipe to slide along the pipe's longitudinal axis, the shaft bearing a forward point for penetrating the fluid bed, and a plurality of diamond-shaped scraping elements whose outer surfaces are arcuate about said axis to closely mate the inner surface of the pipe, each element having an oppositely mounted partner to form a pair, each pair being mounted 90° about said axis from the pair directly above it, and

(b) piston and cylinder means for imparting longitudinal reciprocal motion to the shaft by application of air pressure;

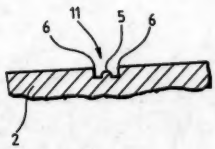
wherein the shaft and scraping elements are fabricated from a metal capable of withstanding corrosion in a chlorine jet pipe atmosphere.

4,616,376

MEANS FOR CLEANING A BLADE OF A WINDOW GLASS WIPER OF A VEHICLE

Mikko Paretskoi, Vantaa, Finland, assignor to Turvaura OY, Helsinki, Finland

Filed Dec. 12, 1985, Ser. No. 807,984
Int. Cl.[4] B60S 1/02
U.S. Cl. 15—250 R 2 Claims



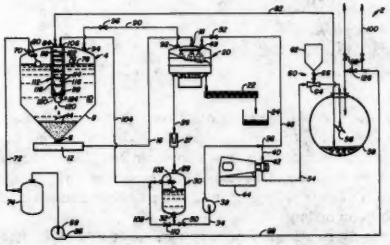
1. Means for cleaning a blade of a window glass wiper of a vehicle, comprising at least one wiping edge (6) provided on the outer surface of the glass (2) within the area of motion of the wiper blade (3), whereby said blade (3) slides across the wiping edge when the wiper is on operation, which wiping edge (6) is formed by an edge of a groove provided on the surface of the glass (2), characterized in that the bottom of the groove (11) is provided with a ridge (5) extending longitudinally with respect to the groove essentially in the middle thereof, whereby the upper edge of said ridge (5) is rounded and has a lower position than the outer surface of the glass (2).

4,616,377

RECYCLED LIQUID CLEANING SYSTEM

William G. Urbani, Stockton, Calif., assignor to Industrial Innovations, Inc., Stockton, Calif.

Filed Oct. 19, 1984, Ser. No. 662,880
The portion of the term of this patent subsequent to Aug. 21, 2001, has been disclaimed.
Int. Cl.[4] B08B 9/08
U.S. Cl. 15—302 10 Claims



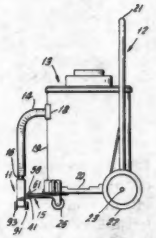
1. A system for cleaning a dirty surface comprising:
a main vessel partially filled with a cleaning liquid;
means for drawing a partial vacuum within the main vessel in a partial vacuum region above the free surface of the cleaning liquid;
means for removing liquid from the main vessel and directing it thorugh a liquid cleaner nozzle and against the dirty surface to dislodge contaminants from the dirty surface;
hose means for fluidly connecting said partial vacuum region to a cleaning liquid and dislodged contaminants collection point associated with the dirty surface for passage of the cleaning liquid and dislodged contaminants through the hose means and into the main vessel through a suction inlet; and
said liquid removing means including a solids/liquid removal pump fluidly connected to a bottom region of the main vessel, a solids separator connected to an outlet of the removal pump to separate solids from liquid, a makeup tank connected to a liquid outlet of the solids separator having a first outlet fluidly connected to the inlet of a pressure pump and a second outlet fluidly connected to the partial vacuum region, the pressure pump having an outlet fluidly connected to the liquid cleaner nozzle.

4,616,378

MEANS FOR MOUNTING FLOOR PICKUP NOZZLE TO DOLLY FOR VACUUM CLEANER

Robert C. Berfield, Jersey Shore, and Robert Crevling, Williamsport, both of Pa., assignors to Shop-Vac Corporation, Williamsport, Pa.

Filed Apr. 24, 1985, Ser. No. 726,612
Int. Cl.[4] A47L 11/30, 7/00
U.S. Cl. 15—353 20 Claims



1. Mobile vacuum cleaner apparatus including:
a vacuum cleaner, a dolly supporting said cleaner, a floor nozzle unit, mounting means securing said nozzle unit to said dolly in operative position at the front thereof, and conduit means operatively connecting an outlet of said nozzle unit to an inlet of said cleaner;
said dolly including a horizontal base having well means at the front thereof, floor engaging swivel-type wheel means having a vertical axis portion removably held in said well means, handle means extending from said base at the rear thereof, and floor engaging additional wheel means connected to said base at the rear thereof;
said nozzle unit including an elongated slot-like inlet facing the floor, said outlet being relatively small compared to said slot-like inlet; and
said mounting means including a plate extending forward of said base and including aperture means through which said vertical axis portion extends before entering said well means.

4,616,379

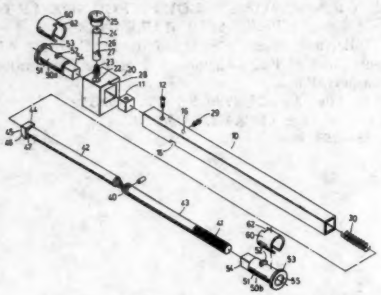
CONCEALED PULL HANDLE

Kuei M. Lio, No. 6-1, Lane 291, Chung-Cheng Road, Taichung City, Taiwan

Filed Oct. 15, 1984, Ser. No. 661,181
Int. Cl.[4] B25G 1/04
U.S. Cl. 16—115 1 Claim

1. A pull handle assembly for a piece of luggage comprising: an elongated tube; mounting members attached to each end of said tube for mounting said tube inside the piece of luggage; an elongated handle, comprised of at least two rods pivoted to each other and a butt provided at a remote end of one rod of said at least two rods, located in said tube; a first spiral compression spring positioned in said elongated tube between a first end of the tube and said butt for biassing said handle to extend outward through a second end of said tube; and means for locking said handle to maintain said handle substantially within said tube, the means comprising an opening in a wall of said tube, a body, the body being sleeved onto said tube at said opening and having a blind hole which is substantially orthogonal to said tube, a one piece cylindrical shaped key rod re-

ceived in said blind hole and having a hook end at a first bottom portion and a separate button head attached to a second top portion of the key rod with a hatched portion therebetween, and a second spiral compression spring positioned between the bottom of said blind hole and the bottom of the hook end for biassing said key rod to project out of said body so that said button head is accessible from outside of the piece



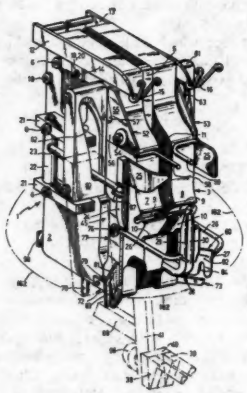
of luggage and, said key rod extends through the opening provided in the wall of the tube with said notched portion extending at least partially around said one rod and said hook end catches said butt on the side of the butt adjacent said second spring and remote from the button head, said hook end releasing said butt when said button head is depressed allowing the handle to be extended out of said tube under the force of said first spiral compression spring.

4,616,380

POULTRY HOLDING MECHANISM WITH IMPROVED BOTTOM PRESSING MEANS

Rudolf J. Tieleman, Doesburg, Netherlands, assignor to Linco Holland Engineering B.V., Doesburg, Netherlands

Filed Jan. 20, 1984, Ser. No. 572,456
Int. Cl.[4] A22C *21/06*
U.S. Cl. 17—11 **9 Claims**



1. A mechanism for holding slaughtered birds in a poultry cutting machine, said cutting machine having a leg-cutting knife for cutting the legs from the rumps of the birds, comprising,

a support member having a support face which engages and supports a bird while the bird is being cut into pieces,

means for holding the bird at a position where it lies against said support member,

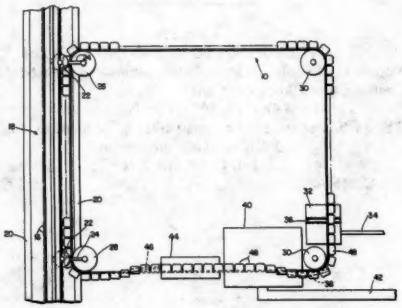
rump engaging means spaced inwardly of the legs of a bird on the support member, means for moving the rump engaging means in a forward direction relative to the bird to engage the bottom of the bird and press it in a forward direction to a position where it will not be cut by the leg-cutting knife while the legs are being cut from the rumps.

4,616,381

OVA HARVESTING SYSTEM

Clarence E. Harris, Jr., Beltsville, Md., assignor to The United States of America as represented by the Secretary of the Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 496,518, May 20, 1983, abandoned. This application Apr. 17, 1985, Ser. No. 724,013
Int. Cl.[4] A22C *21/06*
U.S. Cl. 17—45 **7 Claims**



7. A method of harvesting ova from the carcasses of slaughtered fowl being treated on a poultry evisceration line of the type which includes a carcass conveyor for moving carcasses to various work stations including, in sequence, an opening cut station, a viscera pulling station, and an inspection station, the method comprising:

removing ova from a poultry carcass at an ova collecting station located on said evisceration line between said opening cut station and said viscera pulling station;

placing the ova in a cup located in close proximity below said carcass, said cup being one of a plurality of cups mounted sequentially along a cup conveyor positioned in a manner such that said cup conveyor converges with said carcass conveyor upstream from said ova collecting station and diverges from said carcass conveyor upstream from said viscera pulling station;

driving said cup conveyor in a manner such that when a carcass is at said inspection station the cup containing the ova from that carcass is over an ova reject tank which is located beneath said cup conveyor at a point remote from said evisceration line;

discharging into said ova reject tank all ova from carcasses which have been rejected by remote control from the inspection station;

collecting all nonrejected ova.

4,616,382
SHRIMP-PEELING MACHINE ACCORDING TO THE METHOD

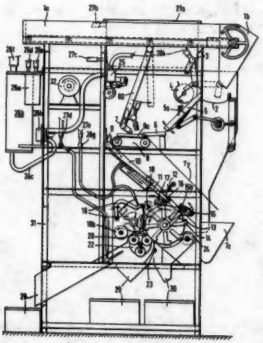
Dirk Van Woensel, and Ilja Van Woensel, both of Haarlem, Netherlands, assignors to Megapel BV Mechanische Garnalenpeltechniek, Haarlem, Netherlands

Filed Apr. 12, 1985, Ser. No. 722,530

Claims priority, application Netherlands, Aug. 17, 1983, 8302887

Int. Cl.[4] A22C *29/02*

U.S. Cl. 17—73 **14 Claims**



1. Shrimp-peeling machine, comprising a supply unit for boiled shrimps from which impurities have already been removed, a receptacle unit for receiving shrimps, means for picking up, further conveying and transferring in a correct position and in a correct sequence the shrimps (FIGS. 3–12), a peeling unit comprising a peeling disc (13), provided with means (14) for individually clamping and further conveying with the peeling disc the separate shrimps, cutting means (17), cooperating with the peeling disc for slitting the shrimps, tail-pulling elements (19) and means for removing the shrimp meat from the shell of each shrimp (22) and means for separately removing and collecting the shell and the meat (28–30), characterized in that the receptacle unit (FIG. 2) is adapted for keeping a small quantity of shrimps in a vibratory motion and at some distance above the bottom of the receptacle unit is mounted a suction mouth being mounted (36) for picking up a separate shrimp and, after displacement of the suction mouth, repelling a picked-up shrimp by means of compressed air into a time-divider (FIG. 4) for periodically transferring a shrimp in the pick-up and conveying means.

4,616,383
BELT BUCKLE

Günter H. Röhm, Heinrich-Röhm-Str. 50, 7927 Sontheim, Fed. Rep. of Germany

Filed Oct. 24, 1985, Ser. No. 790,964

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1984, 3438996

Int. Cl.[4] A44B *11/25*

U.S. Cl. 24—265 BC **7 Claims**

1. A belt buckle comprising:

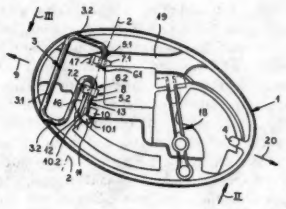
a generally planar buckle plate having a rear face;

a pair of pivots on the rear face defining and spaced apart along an axis extending generally parallel to the plane of the buckle, one of the pivots being formed as a radially closed eye open only axially and the other pivot being open axially and also being formed with a slot open in a radial direction generally parallel to the plane;

a loop adapted to engage through the end of a belt;

a short pintle and a long pintle extending in the same direction from the loop in line with one another, the short pintle normally extending on the axis through the eye pivot and the long pintle normally extending in a fully engaged position on the axis through the slotted pivot and at least a predetermined axial distance in one axial direction past the slotted pivot, the slot being wider than the long pintle, the loop being movable angularly in the pivots between a normal end position and an opposite end position angularly offset therefrom;

a retainer formation on the rear face spaced axially less than the predetermined distance in the one direction from the slotted pivot and spaced in the radial direction from the slotted eye, the long pintle in the fully engaged position normally engaging the retainer formation in the radial



direction, whereby the retainer formation normally prevents the long pintle from moving in the radial direction out of the slotted eye through the slot thereof;

a radial projection on the long pintle axially offset in the one axial direction in the fully engaged position thereof from the slotted pivot by the predetermined distance; and

an abutment on the buckle plate offset axially from the slotted pivot generally by the predetermined distance and engageable axially with the slotted pivot in an axial direction opposite the one direction except when the loop is generally in the opposite end position in which case the abutment and projection are axially out of line and the projection can move axially past the abutment.

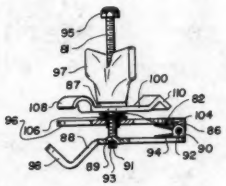
4,616,384
FLAG FRAME AND CLAMP

Ross Lowell, Pound Ridge, N.Y.; Marvin Seligman, Teaneck, N.J., and Edward Calamai, Pleasantville, N.Y., assignors to Lowel-Light Manufacturing, Inc., N.Y.

Continuation of Ser. No. 483,488, Apr. 11, 1983, abandoned. This application Apr. 30, 1985, Ser. No. 728,156

Int. Cl.[4] A44B *21/00*

U.S. Cl. 24—335 **5 Claims**



1. A clamp assembly for clamping together rod-like members of photographic equipment at any angular relationship, comprising a first clamp plate having opposite flat sides and a substantially central opening therethrough, a second clamp plate pivotally connected to said first clamp plate at a pivotal connection, said first and second clamp plates having juxtaposable engaging portions spaced from said pivotal connection for holding a rod-like member therebetween, said engaging portion of said first clamp plate defined on one of said flat sides and said engaging portion of said second clamp plate having an

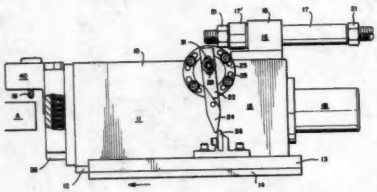
elongated profiled concave cross-section facing said first clamp plate, a third clamp plate having a substantially central opening aligned with said opening of said first clamp plate and mounted for rotation on said first clamp plate on a side of said first clamp plate facing away from said second clamp plate, a threaded presser rod extending through said aligned openings of said first and third clamp plates, said threaded presser rod being freely rotatable and freely axially movable with respect to said aligned openings, means engaged between said presser rod and said second clamp plate for establishing a fixed rotational position between said presser rod and said second clamp plate and for permitting pivotal motion between said second clamp plate and said presser rod, a knob threadably engaged on said presser rod and movable into a fixed position on said presser rod against said third clamp plate on a side of said third clamp plate away from said first and second plates, to simultaneously press said first, second and third clamp plates together for pressing said engaging portions of said first and second clamp plates together and for pressing engaging portions of said third clamp plate toward the other of said flat sides of said first clamp plate, said third clamp plate being mounted for rotation about said presser rod and including a pair of elongated concave engaging portions on opposite sides of said presser rod respectively, each of said engaging portions having an elongated profiled concave cross-section facing said first clamp plate for clamping an elongated member between said first and third clamp plates in any rotational position of said third clamp plate and the elongated member with respect to said first clamp plate, said first and second clamp plates being pivotally mounted to each other about a first axis, said threaded presser rod extends in a second axis which is orthogonal to said first axis, first spring means connected between said first and second clamp plates adjacent said pivotal connection for biasing said juxtaposable engaging portions of said first and second clamp plates away from each other, and second spring means engaged between said first and third clamp plates for biasing said first and third clamp plates apart so as to aid in unclamping an elongated member from between said third and first clamp plates.

4,616,385

ROTARY SYNCHRONOUS CROSS DRILLING ATTACHMENT

Harold E. Wheeler, Athens, Pa., assignor to Wheeler Tool Company, Athens, Pa.

Filed Aug. 24, 1984, Ser. No. 644,008
Int. Cl.[4] B23B *3/26*
U.S. Cl. 29—27 C **12 Claims**



1. A rotary synchronous cross drilling apparatus for use with a machine tool assembly having a synchronous rotating workpiece, comprising

a movable slide member for slidably supporting said drilling apparatus parallel to a workpiece and advancing said drilling apparatus towards and away from said workpiece at a right angle thereto,

a stop means for arresting said drilling apparatus at a desired location with respect to said workpiece,

said drilling apparatus having a rotary portion and a means for rotating said rotary portion,

a drill means including means for rotating said drill means and having a movable support means therefor disposed on said rotary portion, and

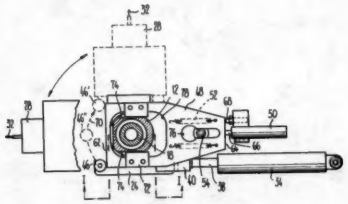
actuating means disposed in said drilling apparatus and responsive to the location of said movable slide member for actuating said movable support means at said desired location, whereby said drill means is moved perpendicular to said workpiece and caused to enter said rotating workpiece.

4,616,386

APPARATUS FOR CUTTING AND PREPARING CABLES

Hans Schmid, Langnau, Switzerland, assignor to Megomat AG, Rüschlikon, Switzerland

Filed Oct. 29, 1984, Ser. No. 666,290
Claims priority, application Switzerland, Nov. 7, 1983, 5986/83
Int. Cl.[4] H01R *43/00*; H02G *1/12*
U.S. Cl. 29—33 M **12 Claims**



1. In apparatus for preparing cables including a grip head having a cable gripping device swingable by a drive between end positions delimited by shock absorbing means and being mounted on one end on a shaft rotatable about an axis extending rectangularly to a cable run,

the improvement comprising in combination:

a force-transmitting element coupled to be swingable with said grip head in spaced relationship to said axis;

a link between said force-transmitting element and said shock absorbing means; and

means for positioning said force-transmitting element in a mid-position between end positions thereof opposite to said shock absorbing means and on a line intersecting said axis at right angles.

4,616,387

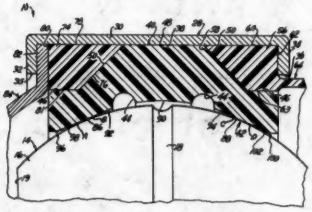
METHOD OF MANUFACTURING SPHERICAL AND CYLINDRICAL BEARINGS

Joseph E. Smith, Jr., Birmingham, Mich., assignor to O & S Manufacturing Company, Whitmore Lake, Mich.

Division of Ser. No. 356,368, Mar. 9, 1982, Pat. No. 4,493,512, which is a continuation-in-part of Ser. No. 286,470, Jul. 24, 1981, Pat. No. 4,386,869. This application Oct. 9, 1984, Ser. No. 659,531
Int. Cl.[4] B21D *53/10*
U.S. Cl. 29—149.5 B **3 Claims**

1. A method of manufacturing a bearing comprising an inner member having a peripheral surface of regular predetermined contour, a hollow shell, a bearing ring disposed in said shell and having a bearing surface in sliding engagement with a peripheral bearing surface of said inner member, and means between the inner surface of said shell and the peripheral surface of said bearing ring for biasing the bearing surface of said bearing ring towards the peripheral bearing surface of said inner member, said method comprising forming said bearing surfaces such that major areas of the bearing surfaces are non-conforming in shape to a slight degree and the bearing surfaces in sliding engagement have each a minor area substantially less than the total bearing surface area available, inserting said bearing ring into said hollow shell and onto said inner

member with said biasing means disposed between the inner surface of said shell and the peripheral surface of said ring to preload and cause engagement of said minor area of said ring with said inner member, and wearing-in said surfaces in sliding engagement for progressively causing an increase in areas of



said surfaces in sliding engagement, wherein the bearing surface of said bearing ring and the peripheral bearing surface of said inner member in sliding engagement mutually engage after assembly at portions intermediate the ends of said bearing ring available bearing surface.

4,616,388

PROCESS FOR PRODUCING A HYDRODYNAMIC BEARING HAVING INTERNAL FOIL CARTRIDGE

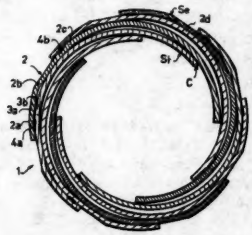
Jacques Soum, and Christian Malabre, both of Paris, France, assignors to ABG Semca, Paris, France

Filed May 23, 1983, Ser. No. 496,824

Claims priority, application France, May 27, 1982, 82 09476

Int. Cl.⁴ B21D *53/10*

U.S. Cl. 29—149.5 S **11 Claims**



1. A process for producing a hydrodynamic bearing for supporting and guiding a rotary machine shaft, said bearing being of the type comprising, in the bore of a bearing shell, several thin curved foils partially overlapping so as to form an internal floating surface and which cause, during rotation thereof, the formation of a fluid film between said shaft and said surface, said process consisting of:

manufacturing a self contained cartridge thus forming the internal functional assembly of the bearing, said cartridge being formed from thin foils each fixed to its two next adjacent foils at locations staggered along said foils at overlapping parts thereof, so as to form a self-contained assembly having an internal floating surface and, an external peripheral surface of the self-contained cartridge formed by the outermost foil areas which has a diameter corresponding to that of the bore of the bearing shell,

inserting said cartridge into the bore of the bearing shell, then securing it against rotation and axial translation with respect thereto.

4,616,389

MANUFACTURE OF CAMSHAFTS

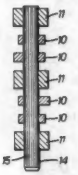
Roger H. Slee, Warwick, England, assignor to AE PLC, Warwickshire, England

Filed Apr. 12, 1985, Ser. No. 722,855

Claims priority, application United Kingdom, Apr. 14, 1984, 84 09771

Int. Cl.⁴ B23P *15/00*; F16H *53/06*; B22F *3/10, 5/08*

U.S. Cl. 29—156.4 R **7 Claims**



1. A method of manufacturing a camshaft, comprising forming a plurality of cams separately from a shaft on which the cams are to be fixed, with each cam having a profiled shaft-engaging hole whose size is smaller than the required final size thereof, positioning the cams on a correspondingly profiled dummy shaft so that the cams have a required relative angular orientation and axial spacing, the profiles of the dummy shaft and the cams preventing relative angular movement therebetween, holding the positioned cams in a jig to maintain said required relative orientation and spacing, removing the dummy shaft, heating the cams and machining the holes to be concentric and of a precise final size and profile, inserting a correspondingly sized and profiled shaft through the machine holes and then cooling the cams to shrink the cams onto the shaft to fix the cams to the shaft in said required relative orientation and spacing.

4,616,390

SUPERDENSITY ASSEMBLY METHOD AND SYSTEM FOR PLASTIC HEAT EXCHANGER RESISTS LARGE BUOYANCY FORCES AND PROVIDES FAST MELT DOWN IN PHASE CHANGE THERMAL STORAGE

Calvin D. MacCracken, 325 Morrow Rd., Englewood, N.J. 07631

Filed Oct. 18, 1984, Ser. No. 662,387

Int. Cl.⁴ B23P *19/02*

U.S. Cl. 29—157.3 R **4 Claims**

1. A method of making a coil tube bundle for a heat exchanger which comprises

(a) forming substantially equally spaced slots inwardly along a front edge of each of a multiplicity of substantially rigid strips with each slot defining a rounded seat opening through a narrower funnel throat to the front edge of the strip,

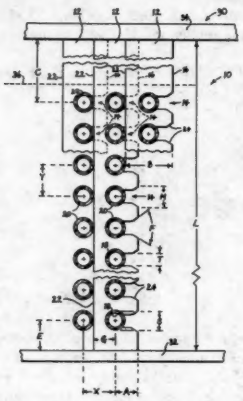
(b) disposing the strips parallel to one another with their respective slots aligned in rows and facing in the same direction,

(c) disposing flexible tubes of resilient circular cross-section across the strips transverse to the respective rows of aligned slots,

(d) engaging the strips and tubes so that each tube passes through the respective slot throat and is resiliently flattened and then springs back into substantially circular cross-section tightly embraced within the rounded seat of the slot to form an interconnected grid of rigid strips and flexible tubes, and

(e) coiling the grid into a bundle with the strips parallel to a central axis and the tubes forming respective spirals with

convolutions of each contacting and being spaced apart by rear edges of the strips opposite the slotted front edges



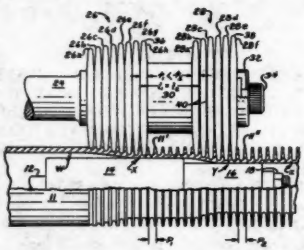
with the tubes supported at substantially equal intervals throughout their lengths.

4,616,391

APPARATUS FOR MAKING HEAT EXCHANGE TUBES

James L. Cunningham, and Bonnie J. Campbell, both of Decatur, Ala., assignors to Wolverine Tube, Inc., Decatur, Ala.

Filed Jun. 24, 1985, Ser. No. 748,098
Int. Cl.[4] B21D *53/02;* B23P *15/26*
U.S. Cl. 29—157.3 AH 2 Claims



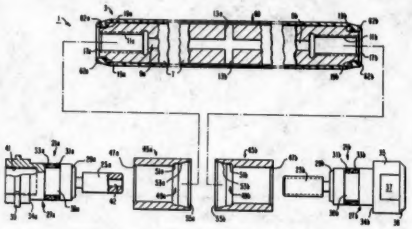
1. Apparatus for finning a heat exchange tube of difficult to fin material such as titanium or stainless steel to obtain greater than normal fin heights in a single pass, said apparatus comprising at least two disc supporting arbors positioned around a mandrel which has at least two axially spaced surfaces of different diameters, said arbors each supporting at least first and second sets of axially spaced finning discs and an intermediate spacer, said discs being of identical contour at their tips but of progressively increasing diameter, with the discs of said second set being spaced at a greater pitch than the discs of the first set, said at least two sets of discs being positioned so as to overlie said at least two axially spaced surfaces of said mandrel when a tube is being finned, the first of said sets of discs being adapted to form fins on said tube to at least about their final diameter but only a fraction of their final fin height and the second of said sets of discs being adapted to deepen the roots of the fins formed by the first disc set to their final depth while leaving the tips of the fins substantially unaffected.

4,616,392

BLADDER MANDREL FOR HYDRAULIC EXPANSIONS OF TUBES AND SLEEVES

David A. Snyder, N. Huntingdon Township, Huntingdon County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 4, 1984, Ser. No. 657,553
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—283.5 11 Claims



1. A bladder mandrel for applying a radially expansive force to the interior of a conduit, comprising:

(a) a mandrel assembly circumscribed by first and second grooves having a fluid port for conducting fluid to the outside surface of the mandrel assembly;

(b) a pressurized fluid source fluidly connected to the port of the mandrel, and

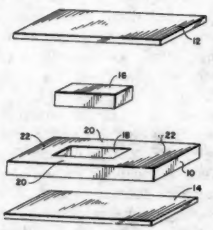
(c) a bladder formed from a sleeve of resilient material circumscribing the mandrel assembly over the fluid port, wherein each of the edges of the sleeve terminates in a sealing bead receivable within one of said mandrel grooves and having a fluid-capturing recess for capturing pressurized fluid flowing out of the fluid port of the mandrel assembly, each bead having an inner portion and an outer portion, and said fluid-capturing recess of each bead being located between the inside surfaces of the sleeve and the inner portion of the sealing bead so that the pressurized fluid sealingly engages each bead into its respective groove.

4,616,393

APPARATUS AND METHOD FOR ROLLING A METAL MATRIX COMPOSITE PLATE OR SHEET

Richard J. Beauregard, Forest, and John B. Boyd, Lynchburg, both of Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Feb. 1, 1985, Ser. No. 697,555
Int. Cl.[4] B23P *17/00*
U.S. Cl. 29—423 8 Claims



1. Apparatus for constraining a metal matrix composite material during the rolling process comprising a frame member having an aperture formed therein with a configuration complementary to the configuration of the material to be rolled and

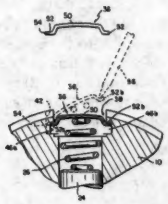
being formed from a ductile material having deformation properties compatible with the deformation properties of the material to be rolled, said aperture receiving the material and constraining same during the rolling process.

4,616,394

METHOD OF LOCK CAPPING

Walter E. Best, and William R. Foshee, both of Indianapolis, Ind., assignors to Best Lock Corporation, Indianapolis, Ind.

Division of Ser. No. 471,277, Mar. 2, 1983, Pat. No. 4,531,390.
This application May 13, 1985, Ser. No. 733,102
Int. Cl.⁴ B23P *11/00, 11/02*
U.S. Cl. 29—436 **5 Claims**



1. The method of capping a tumbler pin lock comprising

forming a lock body with a series of tumbler pin bores and a groove crossing the outer ends of the bores and having undercuts in its sides,

inserting tumbler pins with springs thereon into said tumbler pin bores,

providing an elongated cap including opposite outward-presented edge portions which are resiliently retractable toward each other,

engaging one such edge portion edgewise in the undercut at one side of the groove, and applying force to the opposite edge portion to yieldingly move such opposite edge portion into the undercut at the opposite side of the groove.

4,616,395

RAILROAD TRACK FIXATION METHOD AND APPARATUS

Virgil A. Farese, Framingham; Fred C. Grover, West Rox.; Steve R. Moore, Woburn, and Robert W. Gilfillan, Framingham, all of Mass., assignors to Perini Corporation, Framingham, Mass.

Filed Jun. 30, 1983, Ser. No. 510,087
Int. Cl.⁴ B23Q *3/00;* E01B *3/28*
U.S. Cl. 29—460 **7 Claims**

1. A method of laying a railroad track having parallel rails comprising the following sequence of steps:

(a) forming an elongated road bed for the track;

(b) positioning, in tandem, a series of preformed concrete slabs along the track bed, each of the slabs having a bottom face facing the track bed, and a top face with at least one cavity in its top face;

(c) locating a series of elongated gauge beams above the slabs, each gauge beam adapted to temporarily hold a pair of rails at the proper height, gauge and cant relative to the slab on which it is located, each gauge beam being aligned across the direction of the rails:

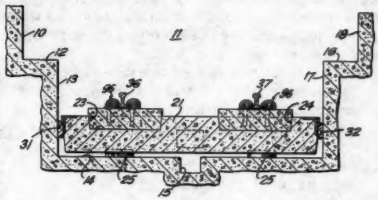
(d) positioning a pair or rails in the series of gauge beams and adjusting the rails to the said proper height, gauge and cant thereon by gauge beam adjustment means:

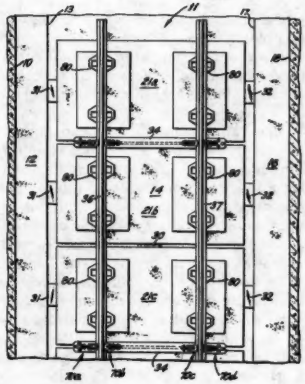
(e) removably positioning a template over the slab cavity:

(f) removably attaching a rail-holding shoulder pin, having a shoulder and a pin portion, to the template and to the rail so that the pin portion of the shoulder-pin is within the slab cavity and the template is held suspended above the cavity:

(g) pouring concrete into each cavity up to the bottom face of the template and letting the concrete harden to securely hold said pin portion;

(h) lifting the rails, removing the gauge beams and templates; and





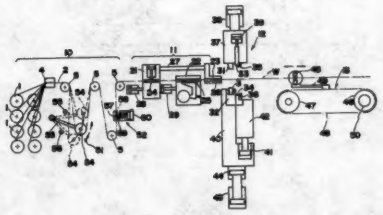
(i) lowering the rails and applying spring clips to the shoulder-pins so that the rails are gripped by the spring clips.

4,616,396

WIRE LENGTH VARYING DEVICE IN COMBINATION WITH APPARATUS FOR MAKING ELECTRICAL HARNESSES

Minoru Matsui, Okayama, Japan, assignor to Nippon Achakutansi Seizo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 27, 1984, Ser. No. 675,408
Claims priority, application Japan, Nov. 29, 1983, 58-225012
Int. Cl.⁴ B23P *19/60;* H01R *43/04*
U.S. Cl. 29—566.1 **1 Claim**



1. A wire length varying device for use in combination with an apparatus for making electrical harnesses, wherein the apparatus includes a connector attaching device for affixing connectors to wire groups continuously supplied along a wire

feed path; a wire length measuring and feeding device including a moving chuck for pulling the wire group already having the connector thereon for a distance corresponding to a desired length of an intended electrical harness; and a wire cutting means and an insulating covering stripping means, said wire cutting means and said insulating covering striping being operable independently of each other, the wire length varying device comprising:

a tension pulley unit located on a wire supply path extending in a wire supplying device communicating with the connector attaching device through the wire feed path, the tension pulley unit including a plurality of pulleys carried to respective swinging arms mounted on a support means of the length varying device, each pulley being placed on the wire running therethrough such that the pulleys exert their weight on the respective wires so as to urge the same in a downward direction;

a return preventive chuck unit for holding the individual wire groups, the return preventive chuck unit being located on the support means between the tension pulley unit and a wire selecting device receiving wires from the wire supplying device,

the return preventive chuck unit includes first means for accomodating the individual wires, and second pneumatically operable means for selectively holding the individual wires;

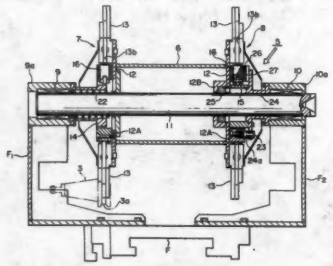
whereby upon an operation of the apparatus, the moving chuck pulls the wire group already having the connector thereon for a distance corresponding to a desired electrical harness, and is then caused to return in the counterflow direction along the wire feed path, thereby allowing the wires therein to return under the additional urge provided by the tension pulleys, and in the course of returning by the first means in accordance with the distances over which the moving chuck is returned, thereby enabling the wires to slacken between the moving chuck and the connector attaching position, and causing the cutting means and the stripping means to work on the respective terminal ends of the wires, and finally causing the moving chuck to advance so as to stretch the wires from the slackened states.

4,616,397

MAGAZINE FOR REPLACEABLE TOOLS AND OPERATION METHOD OF INDEXING TOOLS USING THE MAGAZINE

Hiroshi Yasukawa, Niigata, Japan, assignor to Niigata Engineering Co., Ltd., Tokyo, Japan

Filed Jan. 20, 1984, Ser. No. 572,347
Int. Cl.⁴ B23Q *3/157*
U.S. Cl. 29—568 **21 Claims**



1. A magazine for replaceable tools comprising:

(a) a frame (F1, F2) mounted on a tool pallet (F) adapted to be fed to a rotary table of a machine tool;

(b) a pair of magazine units (7, 8) each comprising a supporter (12) and a plurality of tool holding mechanisms (13) supported on an outer peripheral portion of said supporter (12), said pair of magazine units being rotatably supported relative to a center axis extending through said frame (F1, F2), said magazine units (7, 8) being spaced from each other with a predetermined distance therebetween in the direction of said center axis, a respective tool holding mechanism (13) of one of the magazine units (7, 8) being offset by half a pitch in phase relative to a respective tool holding mechanism of the other magazine unit (8, 7), each of said tool holding mechanisms (13) of a magazine unit comprising means for holding a tool such that it faces a direction opposite the facing direction of tools in tool holding mechanisms of the other magazine unit and in such a manner that the longitudinal axis of the tool extends in parallel with said center axis and means for permitting the tool to be inserted thereinto or released therefrom in a direction perpendicular to the center axis; and,

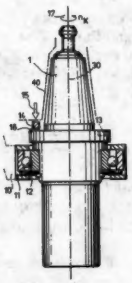
(c) a positioning mechanism disposed between said magazine units (7, 8) and said frame (F1 F2) to position each of said tool holding mechanisms (13) of each of said magazine units into a predetermined index position.

4,616,398

TOOLHOLDER FOR A MACHINE TOOL

Eugen Rütschle, Mühlheim; Rudolf Haninger, and Hans-Henning Winkler, both of Tuttlingen, all of Fed. Rep. of Germany, assignors to Chirom-Werke GmbH, Fed. Rep. of Germany

Filed Oct. 24, 1984, Ser. No. 664,491
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1983, 3339619
Int. Cl.⁴ B23Q *3/157*
U.S. Cl. 29—568 **11 Claims**



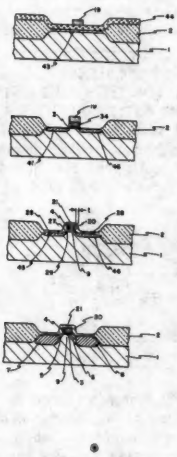
1. In a tool change apparatus for a machine tool having a magazine containing multiple toolholders from which a selected toolholder can be taken by means of an arm and introduced into a working position in a rotating receiving means of the machine tool by said arm having a rotatable holding part enabling the arm to remain in the working position continuously holding said toolholder during operation thereof, the improvement including braking means for, during the introduction of the toolholder into the rotating means, increasing the frictional connection between the holding part and the toolholder in cooperation with the holding part.

4,616,399

METHOD OF MANUFACTURING AN INSULATED GATE FIELD EFFECT TRANSISTOR

Hideyuki Ooka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 597,248, Apr. 5, 1984, abandoned. This application Dec. 23, 1985, Ser. No. 810,849
Claims priority, application Japan, Apr. 11, 1983, 58-63170
Int. Cl.[4] H01L 21/26
U.S. Cl. 29—571 4 Claims



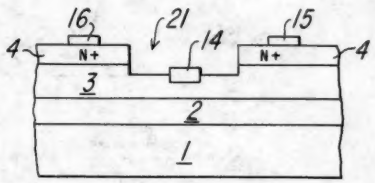
1. A method of manufacturing an insulated gate field effect transistor comprising the steps of forming a polycrystalline silicon gate pattern on a gate insulating film in a central portion of an active region of one conductivity type of a semiconductor substrate, said active region abutting against a field oxide film formed on a major surface of said substrate, introducing an impurity of the opposite conductivity type in a first portion of said active region adjacent to one side of said central portion and to said field oxide film and in a second portion of said active region adjacent to the opposite side of said central portion and to said field oxide film to form impurity regions of the opposite conductivity type having a low impurity concentration in the entire surface areas of said first and second portions, respectively, converting both of the side portions of said polycrystalline silicon gate pattern into silicon oxide by thermal oxidation to form a polycrystalline silicon gate electrode under a condition of any antioxidant film being free on said first and second portions, and under such a condition that the upper surface of said polycrystalline silicon gate is exposed, and introducing an impurity of the opposite conductivity type in a part of said first portion which is separate from said central portion and in a part of said second portion which is separate from said central portion by using said polycrystalline silicon oxide on both sides of said silicon gate electrode as a mask to form impurity regions of the opposite conductivity type having high impurity concentration in said parts of said first and second portions, respectively, said last introducing process being conducted under a condition of an exposure of said silicon oxide converted from said side portions of said polycrystalline silicon pattern.

4,616,400

PROCESS FOR FABRICATING A DOUBLE RECESS CHANNEL FIELD EFFECT TRANSISTOR

Harry M. Macksey, McKinney, and Rick D. Hudgens, Irving, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 21, 1984, Ser. No. 684,523
Int. Cl.[4] H01L 21/203, 21/285
U.S. Cl. 29—571 18 Claims



1. A process for forming a double recess field effect transistor, comprising the steps of:

(a) providing a semiconductor structure having a first semiconductor layer of a first conductivity type, a second more highly doped semiconductor layer thereover of said first conductivity type, source and drain contacts on said second semiconductor layer, a first masking layer over said second layer and said contacts, a support layer over said masking layer, an etchable layer over said support layer and a second masking layer over said etchable layer;

(b) forming a mask in said second masking layer and between said source and drain contacts;

(c) etching away said etchable layer portion beneath said mask with an etchant specific thereto relative to said support layer;

(d) etching away said support layer and said first masking layer portions beneath said mask with an etchant specific thereto relative to said second semiconductor layer;

(e) etching away a portion of the second semiconductor layer portion beneath said mask;

(f) removing a portion of said first masking layer beneath said support layer, the second semiconductor layer portion beneath said just removed portion of said first masking layer and a portion of said first semiconductor layer beneath said portion of said second semiconductor layer beneath said mask;

(g) depositing a electrically conductive material through said mask in said portion of said first semiconductor layer beneath said mask; and

(h) removing said first masking layer and all material thereabove.

4,616,401

METHOD OF FABRICATING AN INSULATED GATE TYPE FIELD-EFFECT TRANSISTOR

Hiroshi Takeuchi, Chigasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 10, 1985, Ser. No. 690,302
Claims priority, application Japan, Jun. 19, 1984, 59-126175
Int. Cl.[4] H01L 21/425, 21/445
U.S. Cl. 29—571 4 Claims

1. A method of fabricating an insulated gate type field-effect transistor, comprising the steps of:

forming a gate electrode on a gate insulating film and patterned by selective etching using a masking member, said gate insulating film being formed on a semiconductor region of a substrate surrounded by a field insulating film;

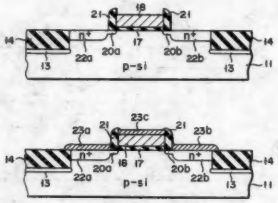
forming source and drain regions aligned to said gate electrode by doping impurities into the semiconductor region;

forming a first insulating film on the entire surface of the substrate by chemical vapor depositon;

etching the first insulating film by reactive ion etching, except for the portions of the first insulating film that are formed on both sides of a laminate consisting of the masking member and the gate electrode;

removing said masking member, thereby exposing said gate electrode;

forming conductive material films by selective chemical vapor deposition on the exposed surfaces of said gate electrode, said source and drain regions and regions surrounding said source and drain regions extending onto said field insulating film;



forming a second insulating film on the entire surface of the substrate including said conductive material films;

forming contact holes in those portions of said second insulating film which are positioned above said gate electrode and said source and drain regions; and

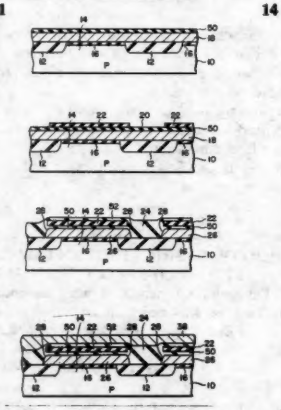
forming interconnection layers contacting said conductive material films exposed through said contact holes.

4,616,402

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE WITH A STACKED-GATE-ELECTRODE STRUCTURE

Seiichi Mori, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed May 2, 1985, Ser. No. 729,660
Claims priority, application Japan, May 7, 1984, 59-90414
Int. Cl.[4] H01L *21/26*
U.S. Cl. 29—571 **14 Claims**



1. A method of manufacturing a semiconductor device with a stacked-gate-electrode structure, comprising the steps of:

forming an element separation area in the surface portion of a semiconductor substrate;

forming a gate insulating film on an island region of said semiconductor substrate surrounded by the element separation area;

forming a non-monocrystalline silicon layer on the whole surface of the resultant structure;

forming over the non-monocrystalline silicon layer an oxidation-resistant film pattern having an opening at a portion thereof corresponding to a portion of the element separation area, an area of said opening being smaller than that of said portion of the element separation area;

forming a first gate electrode by selectively oxidizing a non-monocrystalline silicon layer within the opening with the oxidation-resistant film pattern as a mask to form a separation insulating film with a portion of the non-monocrystalline silicon layer insulatingly separated; and

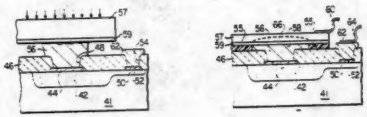
forming, with said oxidation-resistant film pattern left over the first gate electrode and with said separation insulating film left within the opening, a second gate electrode over the surface of the resultant structure to permit the whole surface of the resultant structure to be planarized.

4,616,403

CONFIGURATION OF A METAL INSULATOR SEMICONDUCTOR WITH A PROCESSOR BASED GATE

Eric F. Schulte, and Adam J. Lewis, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 31, 1984, Ser. No. 646,659
Int. Cl.[4] H01L *21/447*
U.S. Cl. 29—572 **12 Claims**



1. A method for fabricating a photodetector, comprising:

fabricating a substrate having an array of switching elements formed therein, the outputs of each of said array elements selectable for connection to a first external terminal;

forming a plurality of vias on said substrate, each via extending to one of said outputs,

forming a plurality of deformable conductive gates, each of said gates disposed in and substantially filling its associated via and being in conductive contact with the input of one of said array elements, the upper surface of each of said deformable gates being higher than the highest point on the surface of said substrate by a predetermined distance;

disposing a layer of dielectric insulating material on one surface of a layer of photosensitive semiconductor material to form a superstrate;

disposing said superstrate adjacent said substrate with said dielectric layer in proximity to said deformable gates;

applying pressure to said substrate and said superstrate directed toward the interface therebetween to conform said deformable gates with the surface of said dielectric layer and force excess deformable gate material over a large portion of the surface of said substrate surrounding said via without contacting a gate of an adjacent via; and

connecting the surface of said photosensitive layer opposite said dielectric layer to a second external terminal.

4,616,404

METHOD OF MAKING IMPROVED LATERAL POLYSILICON DIODE BY TREATING PLASMA ETCHED SIDEWALLS TO REMOVE DEFECTS

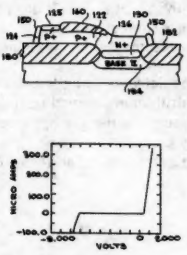
Scott W. Wang, Sunnyvale; Mammen Thomas, and Wen C. Ko, both of San Jose, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Nov. 30, 1984, Ser. No. 676,684
Int. Cl.[4] H01L *21/265, 21/425*
U.S. Cl. 29—576 B **19 Claims**

1. An improvement in the process for forming a lateral polysilicon diode in a polysilicon layer on an integrated circuit structure wherein said polysilicon layer is initially plasma

etched to form the polysilicon body for said diode and then selectively doped sufficiently in two areas to form a low resistance semiconductor diode; said improvement comprising:

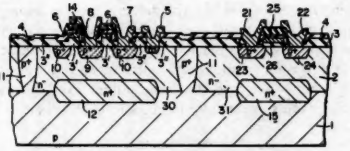
treating the lateral edges of said polysilicon remaining after said plasma etch to remove defects therein whereby current leakage around the lateral edges of the resulting diode are reduced resulting in a polysilicon diode characterized by low reverse current leakage, a breakdown voltage of at least 5 volts, and low series resistance permitting high current flow before being limited by saturation.



4,616,405
SEMICONDUCTOR DEVICE AND MANUFACTURING METHOD THEREOF

Hideki Yasuoka, Musashino, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 378,737, May 17, 1982, abandoned, which is a continuation of Ser. No. 158,879, Jun. 12, 1980, abandoned. This application Jan. 14, 1985, Ser. No. 691,061
Claims priority, application Japan, Jun. 29, 1979, 54-81384
Int. Cl.[4] H01L *21/90*
U.S. Cl. 29—578 **33 Claims**



1. A manufacturing method for forming a semiconductor device, comprising the steps of:

forming a first insulating film on one principal surface of a semiconductor substrate;

forming a conductive film on said first insulating film;

removing said conductive film selectively to leave said conductive film at a given portion on said first insulating film;

removing said first insulating film selectively, with the conductive film left at a given portion used as a mask;

forming emitter and collector areas in surface regions extending to said one principal surface of said semiconductor substrate by introducing impurities where said first insulating film has been removed;

forming a second insulating film at least on the given portion of the conductive film left on the first insulating film;

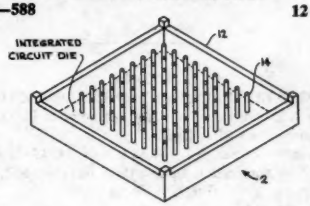
removing said second insulating film selectively to expose at least a part of the given portion of the conductive film left on the first insulating film; and

forming a first conductor layer electrically connecting the exposed part of the given portion of the conductive film and said emitter area or collector area.

4,616,406
PROCESS OF MAKING A SEMICONDUCTOR DEVICE HAVING PARALLEL LEADS DIRECTLY CONNECTED PERPENDICULAR TO INTEGRATED CIRCUIT LAYERS THEREIN

Candice H. Brown, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 27, 1984, Ser. No. 655,476
Int. Cl.[4] H01L *23/02, 23/48, 23/28*
U.S. Cl. 29—588 **12 Claims**



1. A method for making a semiconductor device comprising an integrated circuit die and a mounting package including leads to interconnect the die with external electrical components, said process comprising:

(a) forming an array of parallel conductor pins equidistantly spaced apart hexagonal to one another to provide enhanced spacing;

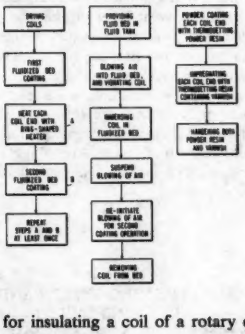
(b) bonding the array of parallel conductor pins directly to an array of contact pads formed on an integrated circuit die in registry with said pin array while maintaining said die in a plane perpendicular to said parallel pins; and

(c) surrounding said die with a package material capable of protecting said die.

4,616,407
INSULATING METHOD FOR ROTARY ELECTRIC MACHINE

Akinobu Tamaki; Ken Kimura, both of Hyogo; Takeshi Kawakami, and Masao Irie, both of Nagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1983, Ser. No. 563,440
Claims priority, application Japan, Dec. 20, 1982, 57-225670; Dec. 20, 1982, 57-225671; Dec. 20, 1982, 57-225672; Feb. 4, 1983, 58-17694; Mar. 3, 1983, 58-36116; Mar. 3, 1983, 58-36117; Mar. 3, 1983, 58-36124
Int. Cl.[4] H02K *15/10*
U.S. Cl. 29—596 **7 Claims**



1. A method for insulating a coil of a rotary electric machine, comprising the steps of:

winding a mica sheet or mica tape around that part of each coil to be inserted into a slot cut in an iron core of said rotary electric machine, thus forming a first insulating layer;

inserting said coils thus treated into respective slots of said core;

covering an end of each said coil, defined as the portion of each said coil remaining uncovered by said first insulating layer plus a layer overlap region, in its entirety with a thermosetting synthetic resin; and

hardening said thermosetting synthetic resin applied to each coil end by heating, thus forming a second insulating layer.

4,616,408

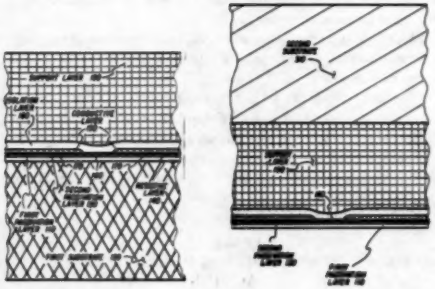
INVERSELY PROCESSED RESISTANCE HEATER

William J. Lloyd, Belmont, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 444,412, Nov. 24, 1982, abandoned. This application Jan. 4, 1985, Ser. No. 687,507

Int. Cl.[4] H05B *3/00*

U.S. Cl. 29—611 **10 Claims**



1. A method of fabricating a resistance heater on a first substrate, comprising in order the steps of:

(1) depositing a first electrically non-conductive, uniformly thick passivation wear layer on the first substrate;

(2) permanently depositing a resistor connected to a plurality of conductors on the first passivation layer;

(3) depositing a support layer; and

(4) removing the first substrate while leaving said first passivation layer to protect the resistor from externally applied stress and thereby exposing an outer surface of the first uniformly thick passivation layer overlaying the resistor, said outer surface being substantially flat.

4,616,409

NON-CONTACT TYPE RING SETTER AND SENSOR FOR USE THEREWITH

John T. Flammini, 1335 W. Morgan St., Rialto, Calif. 92376

Filed Jun. 27, 1985, Ser. No. 750,521

Int. Cl.[4] B23Q *15/00*

U.S. Cl. 29—705 **19 Claims**

1. In a device for placing an annular collar on a drill bit, the drill bit having a tip, a body, and a shank, the device being used for placing the collar on the shank at a predetermined distance from the tip, the device comprising means for causing relative movement between the collar and the drill bit so that the collar is mounted on the drill bit shank, the improvement comprising:

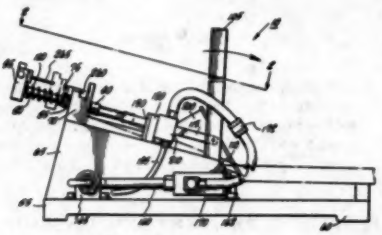
a pressurized gas operated, non-contact sensor for detecting the advance of the tip of the drill, the sensor comprising:

(a) a pressurized gas source; and

(b) a gas pressure detector spaced apart and opposite the gas source:

the gas source and detector being located so that when the collar and the drill bit are moved relative to each other a predetermined amount, the gas pressure detected by the detector changes.

12. A pressurized gas operated, non-contact sensor suitable



for use in a device for placing an annular collar on a drill bit having a nominal diameter of no more than about ¼ inch, the drill bit having a tip, a body and a shank, the device being used for placing a collor on the shank at a predetermined distance from the tip, the sensor being capable of detecting the advance of the tip of the drill, the sensor comprising:

(a) a pressurized gas source comprising an inlet nozzle for passing a pressurized gas, the inlet nozzle having a tip ending in an elongated opening having a longitudinal axis; and

(b) a gas pressure detector comprising a detector nozzle for passing a pressurized gas, the detector nozzle having a tip ending in an elongated opening having a longitudinal axis;

the two openings being spaced apart by a distance of from about 130 mils to about 250 mils, and being opposite to each other such that the longitudinal axes of the two openings are substantially parallel to each other.

4,616,410

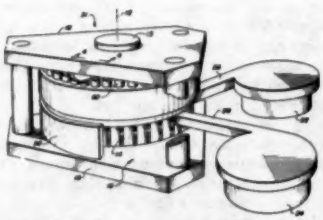
HIGH SPEED LEAD SOCKET ASSEMBLY MACHINE

Philip T. Stokoe, North Attleboro, Mass.; Glenn N. Cleaver, Lincoln, R.I., and Dennis R. Boulais, Danielson, Conn., assignors to Augat Inc., Mansfield, Mass.

Filed May 17, 1985, Ser. No. 735,393

Int. Cl.[4] H01R *43/00*

U.S. Cl. 29—743 **12 Claims**



1. Apparatus for the assembly of socket contacts comprising: a cylindrical drum having a plurality of recesses disposed

about the circumferential wall thereof, each of the recesses having a lower section adapted to retain the sleeve portion of a socket contact, and an upper section adapted to retain the contact assembly portion of the socket contact;

means for rotating the drum at a predetermined speed;

means for providing vacuum at each of the recesses for retention of the sleeve portion and contact assembly portion of the socket contacts in respective sections of the recesses;

means for supplying sleeve portions and contact assembly portions of the socket contacts to respective sections of the recesses;

means above the drum and operative during rotation of the drum to urge the contact assembly portions into the sleeve portions; and

means for ejecting assembled socket contacts from the drum.

4,616,411

APPARATUS FOR FASTENING A DOOR TO A VEHICLE

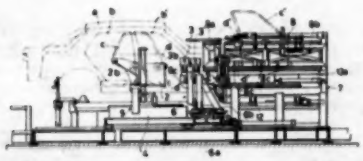
Toshifumi Suzuki, Hidaka; Toshio Kawano, Sakado; Ryoichi Setoguchi, Sayama; Toshio Ishida, Kawagoe, and Seiiti Mikami, Tokorozawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 16, 1985, Ser. No. 734,728

Claims priority, application Japan, May 16, 1984, 59-70406[U]

Int. Cl.[4] B23P *19/00*

U.S. Cl. 29—822 **3 Claims**



1. An apparatus for fastening a door to a vehicle wherein a door hinge of a door inserted in a door opening portion of a vehicle body is bolted to the vehicle body comprising:

a machine frame;

a fastening head movably mounted on the frame;

means for moving the fastening head towards and away from the vehicle body;

a nut runner on the fastening head having a non-gripping means for holding a bolt in a socket on a forward end thereof; and

bolt receiving and supply means on the frame for receiving bolts from a parts feeder and supplying the bolts to the nut runner, said bolt receiving and supply means including:

a bolt supplying head connected to the parts feeder and stationarily positioned to one side of said fastening head relative to the vehicle body,

a bolt transferring head movable between a bolt receiving position facing said supplying head and a bolt delivering position facing said nut runner and having means for holding a bolt, and

means for moving said bolt transferring head between said positions so that a bolt supplied through said supplying head is transferred therefrom by said transferring head to said nut runner.

4,616,412

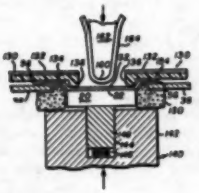
METHOD FOR BONDING ELECTRICAL LEADS TO ELECTRONIC DEVICES

Jon M. Schroeder, 4510 Discovery Point, Byron, Calif. 94514

Continuation of Ser. No. 224,668, Jan. 13, 1981, Pat. No. 4,438,181. This application Nov. 4, 1983, Ser. No. 548,570

Int. Cl.[4] H01R *43/00*

U.S. Cl. 29—827 **9 Claims**



1. A method for thermocompression bonding comprising the steps of:

(a) aligning an electrical contact pad formed on a surface of an electronic component chip with a first contact pad terminal end region of an electrically conductive lead located within a chip bonding site in a first preformed metallic tape, said chip being disposed so that said contact pad thereof is immediately adjacent to a first bonding surface of said first tape;

(b) compressing said bonding surface of said contact pad terminal end region of said conductive lead between said contact pad of said chip and a stem terminal end of a contact pad bonding pressure pad intimately bonded to and protruding from a pressure pad surface of said first tape while simultaneously heating said first tape to a temperature at which said first tape forms a thermocompression bond to said contact pad of said chip, said pressure pad surface of said first tape being that surface thereof which is substantially parallel to and opposite to said bonding surface thereof, said contact pad bonding pressure pad being formed to have a cap terminal end thereof protrude furthest from said pressure pad surface of said first tape, said contact pad bonding pressure pad being formed from a material which is harder than said material of said first tape in the thermocompression bonding temperature range, said compressing force being applied to said surface of said chip furthest from said chip bonding surface of said first tape and to said cap terminal end of said contact pad bonding pressure pad, whereby said bonding surface of said lead is urged into intimate bonding contact with said contact pad of said chip by said force applied to said contact pad terminal end region of said lead through said stem terminal end of said contact pad bonding pressure pad; and

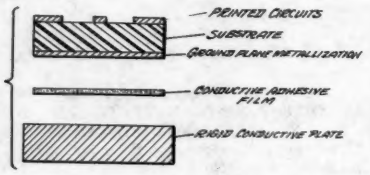
(c) releasing said bonded chip and said first tape from said compressing force.

4,616,413

PROCESS FOR MANUFACTURING PRINTED CIRCUITS WITH AN INDIVIDUAL RIGID CONDUCTIVE METALLIC SUPPORT

Louis Iliou, and Bruno Gotkovsky, both of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 477,521, Mar. 21, 1983, abandoned. This application Jul. 9, 1985, Ser. No. 754,184
Claims priority, application France, Mar. 23, 1982, 82 04916
Int. Cl.[4] H05K *3/30*
U.S. Cl. 29—832 **7 Claims**



1. A process for manufacturing a microwave integrated circuit (MIC) having its own rigid ground plane, said MIC being of the type wherein certain printed conductors form capacitive circuits with respect to said ground plane, comprising the steps of:

providing a substrate that is metallized on its two faces;

engraving a circuit on one of said two faces;

providing a rigid metallic support plate having dimensions at least as large as those of said substrate;

gluing, using an electrically conductive epoxide thermofusible adhesive film, the non-engraved face of said substrate to a surface of said support plate, the rigid plate and engraved substrate together forming a printed circuit assembly;

machining the printed circuit assemble; and

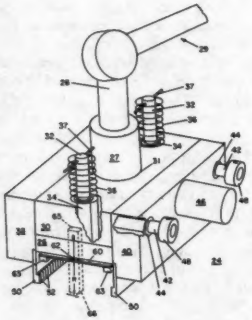
coupling additional components to said assembly to form said MIC.

4,616,414

METHOD AND APPARATUS FOR GRIPPING MULTILEAD ARTICLES

Robert H. Cushman, Princeton Township, Mercer County, N.J., assignor to AT&T Technologies, Inc., Barkeley Heights, N.J.

Filed Mar. 13, 1985, Ser. No. 711,314
Int. Cl.[4] H05K *3/30;* **B23P** *19/00*
U.S. Cl. 29—835 **7 Claims**



1. A method for inserting each of a plurality of flexible leads depending from opposed sides of an article into corresponding apertures in a substrate comprising the steps of:

releasably gripping the article between a pair of opposed, parallel, spaced jaws having opposed depending combs which have spaced slots therein, each slot including an elongated upper section whose cross-section is half-rounded and a tapered lower section, to seat the tip of each lead article in the upper section of a separate one of the slots in the combs;

positioning the jaws to locate the combs proximate the substrate so that the tapered lower section of each slot in each comb is aligned with a corresponding aperture in the substrate;

applying a force to the article to urge the tip of each lead from the upper section into, and along the lower section of, each slot so that the tips of the leads are guided into the corresponding aperture in the substrate; and

releasing the article once all the tips of the leads thereof have been inserted into the corresponding apertures in the substrate by moving the jaws laterally apart.

4. Apparatus for inserting each of a plurality of flexible leads depending from opposed sides of an article into corresponding apertures in a substrate comprising:

a body having first and second opposed sides;

a first jaw mounted to and depending from the first side of said body for gripping one of the opposed sides of the article;

a second jaw slidably mounted to, and depending from said second opposed side of said body so as to be opposite to said first jaw for contacting the other opposed side of the article;

means connected between said body and said second jaw for moving said second jaw towards said first jaw to capture the article therebetween;

the first and second jaws having opposed combs thereon, each comb having spaced slots therein, the slots each having an upper substantially elongated section whose cross-section is half-rounded and a lower tapered section, the slots guiding the tips of the leads of the captured article into corresponding apertures in the substrate; and

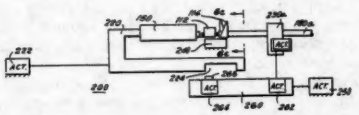
means slidably mounted to said body for urging an article captured between the first and second jaws towards the substrate to move the tip of each lead along the slot and into the corresponding in the substrate.

4,616,415

ELECTRICAL CONNECTOR APPARATUS, AND METHODS AND APPARATUS FOR ASSEMBLING SAME

Ray C. Doutrich, Lebanon, and George T. DeShong, East Berlin, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 30, 1985, Ser. No. 729,162
Int. Cl.[4] H01R *43/00*
U.S. Cl. 29—857 **16 Claims**

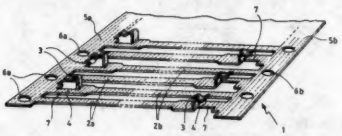


1. The method of fabricating an electrical connector comprising the steps of:

providing a partially pre-assembled connector including a housing having a plurality of longitudinal, laterally adjacent, substantially parallel apertures, each aperture extending all the way through the housing between front and rear housing surfaces, and a longitudinal metal terminal partially inserted in each aperture substantially parallel to the longitudinal axis of the associated aperture, each terminal having a front disconnect portion and an uncrimped rear wire crimp portion, the disconnect portion being disposed in the aperture and a least a portion of the wire crimp portion being outside the housing to the rear of the rear surface;

at least partially withdrawing each terminal from the associated aperture to completely expose the uncrimped wire crimp portion;
placing a wire in the exposed uncrimped wire crimp portion of each terminal;
crimping the exposed wire crimp portion of each terminal around the associated wire to secure the wire to the terminal; and
fully re-inserting the terminal in the associated aperture.

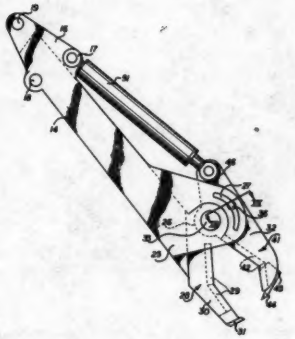
4,616,416
METHOD OF APPLYING CONTACTS TO CIRCUIT SUPPORT
Aimé Cabaud, 28, rue de Villacoublay, Velizy, France
Division of Ser. No. 405,078, Aug. 4, 1982, abandoned. This application Jul. 13, 1984, Ser. No. 630,597
Claims priority, application France, Aug. 14, 1981, 81 15964
Int. Cl.[4] H01R *43/00*
U.S. Cl. 29—884 **1 Claim**



1. A method of applying contacts to a circuit support which comprises the steps of:
forming a contact assembly to be soldered comprising a web composed of a succession of mutually parallel transversely spaced elongated contacts each formed with a head constituted by a clip and a tail remote from the respective head, said contacts alternating in direction along said web in head-to-tail relationship and being coplanar with a clip of one contact lying adjacent a tail of the next contact in said direction, the projecting portions of the respective clips projecting out of the web plane in the same direction, and respective connecting strips integral with each of said contacts along opposite edges of said web whereby said contacts can be separated from said connecting strips, said connecting strips extending in a direction transverse to the longitudinal directions of said contacts;
separating each of said heads from the connecting strip with which it was integral to form a pair of interdigitating but separate contact combs having free clips at the ends of the respective contacts connected to the other contact strip whereby the free clips of the two combs are oriented in opposite directions and remote from each other;
thereafter relatively displacing said combs in a direction perpendicular to said plane; and
thereafter inserting respective supports into the clips of each of said combs.

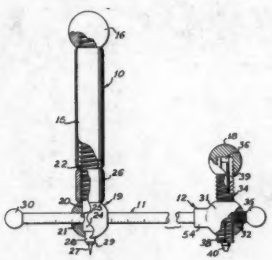
4,616,417
HYDRAULIC SHEAR HEAD ATTACHMENT FOR BACKHOE OR THE LIKE
Sol N. Gross, Pittsburgh, Pa., assignor to AAA Steel and Enterprises Corp., North Versailles, Pa.
Filed Jan. 7, 1985, Ser. No. 689,413
Int. Cl.[4] B23P *19/00*
U.S. Cl. 30—134 **3 Claims**

1. A hydraulic shear attachment means for backhoes and the like, comprising:
(a) a support arm having at one end means for pivotal attachment to a backhoe or like equipment and at its other end a lower jaw member, said arm including a pair of spaced-apart flange members juxtaposed with respect to said lower jaw, each of said flange members having a pivot housing and an arcuate opening concentrically positioned with respect to the axis of said pivot housing;
(b) an upper jaw member pivotably mounted to and disposed between said pivot housings and having at least one support pin extending through said arcuate opening so as to ride therein during rotation of said upper jaw, said upper jaw including means for pivotably mounting at its other end a hydraulic actuating means;



(c) retaining means secured on each end of said support pivots to maintain said flanges in their spaced-apart, upright position; and
(d) hydraulic actuating means mounted to said upper jaw mounting means and the support arm at said attachment means for actuating the upper jaw.

4,616,418
BEAM COMPASS HAVING CHANGEABLE PARTS
Charles R. Wade, III, P.O. Box 297, Dawsonville, Ga. 30534
Filed Jun. 28, 1985, Ser. No. 749,730
Int. Cl.[4] B43L *9/00*
U.S. Cl. 33—27.01 **8 Claims**



1. A beam compass comprising a central post for placement at the center of a circle to be drawn, said central post including center holding means for engagement with the surface on which said circle is to be drawn, a beam extending from said central post perpendicular to said central post and parallel to said surface on which said circle is to be drawn, and a marker carrier mounted on one end of said beam, said marker carrier having a marking means for drawing said circle on said surface, said central post including a connector for selectively holding said beam relative to said central post, a rod extending from said connector along the centerline of said central post, and a sleeve rotatably received over said rod, the arrangement being such that said sleeve can be held while said beam with said marker carrier is rotated with said center holding means as

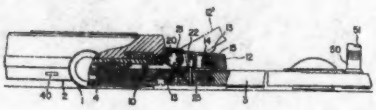
the center, said central post further including a knob mounted on the extending end of said rod and serving as a stop for retaining said sleeve on said rod, said knob being fixed to said rod such that said knob may be rotated to cause rotation of said beam, said connector defining a bore for receiving the inner end of said rod, said connector and said rod defining holes therethrough perpendicular to said bore for slidably receiving said beam, and means for urging said rod upwardly to clamp said beam in a selected position with respect to said connector.

4,616,419

MEASURING DEVICE FOR A FIGURE

Akio Kubo, 655, Yamanouchi Kamakura shi Kanagawaken, Japan

Filed Apr. 17, 1985, Ser. No. 724,150
Int. Cl.[4] G01B 5/26
U.S. Cl. 33—122 **8 Claims**



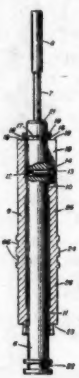
1. A measuring device for a figure comprising; a carriage supported by a pair of wheels for reciprocal movement along a straight line, a measuring lever extending from and pivotally mounted on a shaft attached to said carriage; tracing means provided at the other end of said measuring lever; a locking device for locking said measuring lever in a first horizontal position; switch means cooperating with said locking device for generating a reset signal when said measuring lever is released, said reset signal automatically clearing counters in said measuring device whereby release of said locking device operates sid switch generating a reset signal which measuring counters automatically.

4,616,420

CARTRIDGE HEAD FOR CHECKING LINEAR DIMENSIONS

Guido Golinelli, Bologna, Italy, assignor to Finike Italiana Marposs S.p.A., S. Marino di Bentivoglio, Italy

Continuation of Ser. No. 521,263, Aug. 8, 1983, abandoned. This application May 21, 1985, Ser. No. 736,526
Claims priority, application Italy, Sep. 9, 1982, 3528 A/82
Int. Cl.[4] G01B 7/02
U.S. Cl. 33—172 E **20 Claims**



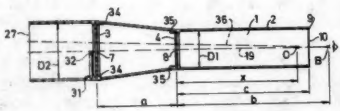
1. A cartridge type gauging head for checking linear dimensions, comprising a substantially tubular casing defining a longitudinal axis, a shaft partially housed in said casing and movable with respect to it along said axis, a feeler coupled to the shaft for contacting the part to be checked, a position transducer for providing a signal depending on the mutual positions of the shaft and the casing, including a first part fixed to the internal surface of the tubular casing and a second part carried by the shaft, resilient means for urging the shaft along a measurement direction, and a guide device including a substantially cylindrical intermediate portion, guide portions lying on either side of the intermediate portion and adapted to guide the axial displacements of the shaft and two substantially cylindrical connection portions connected between the intermediate portion and the guide portions, the intermediate portion having an enlarged thickness with respect to that of both connection portions and being fixed to the internal surface of the tubular casing, both said connection portions defining external surfaces faced to and separate from the internal surface of the casing and being resiliently deformable for preventing the transmission of deformations from the intermediate portion to the guide portions.

4,616,421

SIGHT MEANS

Ivan Forsén, Örnsköldsvik, Sweden, assignor to Inogon Licens AB, Sjalevad, Sweden

Filed May 30, 1985, Ser. No. 739,386
Claims priority, application Sweden, Jun. 7, 1984, 8403082
Int. Cl.[4] F41G 3/00
U.S. Cl. 33—233 **9 Claims**



1. A sight means, particularly for weapons and objects which are to be sighted onto a given point, comprising: two mutually spaced and mutually parallel grid discs (3, 4), each of which includes a transparent disc provided with concentrically lying opaque grid lines (5) separated by transparent interspaces (6); said grid discs (3, 4) being arranged in a tubular housing (2) with two ends; located in the centre of each of said discs (3, 4) is a central region (7, 8) which is devoid of opaque lines (5) and which has a size corresponding approximately to 1/5 to ½ of the disc diameter, through which regions the target is intended to be viewed; said two grid discs (3, 4) having opaque lines (5) whose widths exceed the width of the transparent interspaces (6); said grid discs (3, 4) having mutually different graduation, i.e. a mutually different number of opaque lines (5) per unit of length perpendicular to the opaque lines; a first distance (a) between the grid discs (3, 4) being dimensioned shorter than a second distance (c) between one end (9) of the housing (2), said one end defining a viewing aperture (10) for the person using the sight means, and the grid disc (4) located nearest the viewing aperture (10); and said second distance (c) having a dimension which exceeds the distance corresponding to the near point of a normal eye adjacent the viewing aperture.

4,616,422

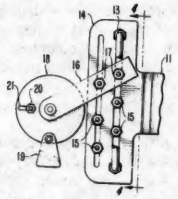
ELEVATED BOWHUNTERS SIGHT

Donald E. Gaddy, Rte. 1, Box 166, Callao, Mo. 63534

Filed Nov. 5, 1985, Ser. No. 795,181
Int. Cl.[4] F41G 1/46
U.S. Cl. 33—265 **3 Claims**

1. A bow hunter sight adapted solely for one shooting from an elevated position, a wheel having a slot formed therein, an

adjustable sighting pin mounted in said slot, a counter weight fixedly mounted on said wheel, and two mounting arms for



journalling said wheel for rotation and which opposite ends of said arms mounts to most conventional sight plates.

4,616,423

TACTICAL DINGHY COMPASS

Kevin E. Shephard, Wollstonecraft, Australia, assignor to J. & K. Shephard Design Pty Limited, Miranda, Australia

PCT No. PCT/AU83/00149, § 371 Date Jun. 20, 1984, § 102(e) Date Jun. 20, 1984, PCT Pub. No. WO84/01623, PCT Pub. Date Apr. 26, 1984

PCT Filed Oct. 21, 1983, Ser. No. 624,687

Claims priority, application Australia, Oct. 12, 1982, PF6301

Int. Cl.[4] G01C *17/02*

U.S. Cl. 33—355 R **6 Claims**

1. A compass comprising a moveable compass card, said compass card being marked into quadrant portions and having an annulus portion, each quadrant of the annulus being subdivided angularly into a plurality of equal sectors each colored differently from the other sectors in that quadrant said sectors forming a color sequence which is repeated in each quadrant of the annulus portion.

4,616,424

MAGNETIC DIRECTION SENSOR

Shunsuke Arakawa, and Hiroya Suzuki, both of Saitama, Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Sep. 12, 1985, Ser. No. 775,412

Claims priority, application Japan, Sep. 13, 1984, 59-192355

Int. Cl.[4] G01C *17/30*

U.S. Cl. 33—361 **6 Claims**

1. A magnetic direction sensor having a head comprising:

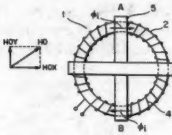
(a) a magnetic wound core composed of a ferromagnetic metal ribbon;

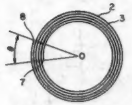
(b) a winding for exciting said magnetic wound core;

(c) a first output winding wound around said core such that it encircles two opposite portions of said core; and

(d) a second output winding wound around said core at a certain angle with said first output winding such that it encircles two other opposite portions of said core; said first and second output windings providing output signals for determining the direction of an external magnetic field with respect to the head;

characterized in that the inner and outer ends of said ribbon





overlap each other circumferentially by an angle between 0.5 and θ_{max} satisfying the equation: $\theta_{max}=\frac{1}{4}D+1.5\alpha+1$ wherein D represents the outer diameter of said core, and θ represents a desired direction accuracy.

4,616,425

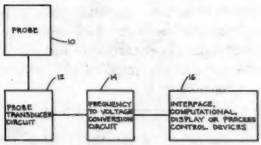
MOISTURE MEASUREMENT APPARATUS AND METHOD

Stanley G. Burns, Ames, Iowa, assignor to Iowa State University Research Foundation, Ames, Iowa

Continuation of Ser. No. 461,311, Jan. 28, 1983, abandoned. This application Nov. 4, 1985, Ser. No. 794,490

Int. Cl.[4] F26B *1/00*

U.S. Cl. 34—13.8 **14 Claims**



1. A method for measuring the moisture content of wood or paper products comprising the steps of:

(a) forming a substantially two-dimensional resistive element on a single surface of the product, said resistive element having an inner portion and an outer portion spaced outwardly from and surrounding the inner portion;

(b) completing a resistance-controlled oscillator circuit by electrically attaching the inner and outer portions of the resistive element into said circuit;

(c) generation by the resistance-controlled oscillator circuit of an output signal the frequency of which is dependent upon the resistance of the resistive element;

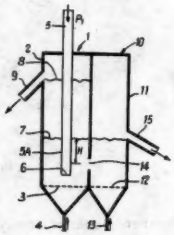
(d) converting said resistance-dependent output signal of the oscillator circuit to a frequency-dependent direct current voltage level, and

(e) initiating a response to said direct current voltage level according to a predetermined relationship between said direct current voltage level and the moisture content of the wood or paper product.

4,616,426
VALVE FOR THE PNEUMATIC DISTRIBUTION OF FLUIDIZABLE MATERIAL

Jean F. Large, Compiegne, France, assignor to Charbonnages de France, Paris, France

Filed Jul. 2, 1985, Ser. No. 751,239
Claims priority, application France, Jul. 4, 1984, 84 10616
Int. Cl.[4] F26B *17/10*
U.S. Cl. 34—57 A 9 Claims

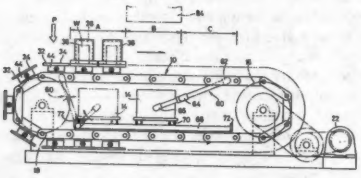


1. Valve for the selective distribution of fluidised material between at least two separate outlets, the valve being arranged to receive fluidisable material via a supply pipeline, the valve comprising a main compartment, a side wall and a bottom of the main compartment, a fluidising means which is located at the bottom of the main compartment and is capable of fluidising the said fluidisable material to an upper level, an overflow pipe which is provided in the side wall and is located at the upper level, at least one auxiliary compartment which is adjacent to the main compartment, said auxiliary compartment comprising a side wall, a bottom, and at least one communication passage which is between the main compartment and the auxiliary compartment through said respective side wall, a fluidising means which is located at the bottom of the respective auxiliary compartment and is capable of fluidising the said fluidisable material to a respective specific level, and an overflow pipe which is provided in the side wall of the respective auxiliary compartment and is located at a level which is at most equal to the level of the overflow pipe of the main compartment, said at least one communication passage being positioned at an intermediate level between the level of the highest fluidising means of the main compartment and the respective auxiliary compartment and the level of the overflow pipe of the respective auxiliary compartment.

4,616,427
VACUUM CONVEYOR SYSTEM

Tsunezo Takeuchi, Aichi, and Isao Mizutani, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Sep. 23, 1985, Ser. No. 779,123
Claims priority, application Japan, Sep. 28, 1984, 59-204373
Int. Cl.[4] F26B *19/00*
U.S. Cl. 34—92 13 Claims



1. A vacuum conveyor system, comprising:

conveyor means having plural mounting portions on which workpieces are mounted, said mounting portions being spaced from each other along an endless track of the conveyor means;

drive means for driving said conveyor means along said endless track;

a plurality of enclosure means provided on said plural mounting portions of the conveyor means, respectively, for forming air-tight enclosed chambers in which the workpieces mounted on the mounting portions are accommodated, respectively;

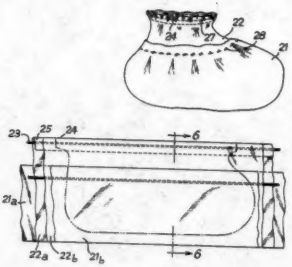
a vacuum source for drawing an atmosphere from said enclosed chambers; and

suction piping means disposed along said conveyor means and travelling together with said conveyor means along said endless track, said suction piping means being connected to said vacuum source and having connections which are adapted to communicate with said enclosed chambers to evacuate the enclosed chambers to a predetermined reduced pressure.

4,616,428
PROTECTIVE SLIPPER ADAPTABLE TO DIFFERENT SIZES

Claude Leger, Thourotte, France, assignor to Dispovet, France

Filed Jan. 28, 1985, Ser. No. 695,260
Claims priority, application France, Dec. 21, 1984, 84 19732
Int. Cl.[4] A43B *3/16, 1/14, 7/12*
U.S. Cl. 36—7.1 R 10 Claims



1. A slipper which may be used in particular as an overshoe and is adaptable to feet of different sizes, comprising two susperposed first sheets of a first material, united along a weld line. an upper edge defining an opening, a sole, a first series of elastic gathers along said upper edge, two second sheets of a second material connected one to the other and to the first sheets by said weld line, these first sheets being placed between the second sheets, each second sheet being further connected to the adjacent first sheet by at least one other weld line and at least one second series of elastic gathers located in an intermediate region between said upper edge and said sole along said other weld line.

4,616,429
DISPOSABLE SHOE COVER

Robert Alcala, El Paso, Tex., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Oct. 2, 1984, Ser. No. 657,021
Int. Cl.[4] A43B *3/16*
U.S. Cl. 36—7.2 9 Claims

1. A disposable shoe cover adapted to fit shoes over a range of sizes comprising:

first and second originally separate flat and generally rectangular panels of flexible sheet material, each defining top, bottom, front and rear edges, the edges of said panels being aligned;

first and second adhesive means securing the front and rear edges, respectively of said panels continuously together;

first and second strips of elastic material;

third and fourth adhesive means for fixing said first and second strips of elastic material in stretched condition to said top edges respectively of said first and second panels with said first and second strips of elastic material extending along substantially the entire length of the edge to which it is fixed;

a third strip of elastic material;

fifth adhesive means for fixing said third strip of elastic material in stretched condition to said bottom edges of said panels and for securing said bottom edges of said panels together;

and sixth adhesive means for connecting a portion only of said top edges of said panels together and extending from the front edge of said cover to provide an access opening adjacent to the rear of said cover.

4,616,430

METHOD OF MAKING AN ARTICLE OF FOOTWEAR

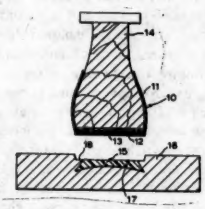
John McQuiggin, Boreham Wood, Great Britain, assignor to E.T.F. Enterprises, Inc., New York, N.Y.

Filed Jun. 25, 1984, Ser. No. 623,922

Claims priority, application United Kingdom, Dec. 23, 1983, 8334445

Int. Cl.[4] A43C *13/08*

U.S. Cl. 36—14 22 Claims



1. A method of making an article of footwear, comprising the steps of:

(a) partially forming the article so as to comprise at least an upper lasted to a first insole;

(b) arranging the partially formed article to fully expose the upper surface of the first insole by turning the partially formed article inside out;

(c) moulding a second insole of elastomeric material onto the exposed surface of the first insole; and

(d) applying an outsole to the article.

4,616,431

SPORT SHOE SOLE, ESPECIALLY FOR RUNNING

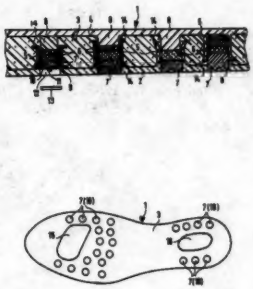
Armin A. Dassler, Herzogenaurach, Fed. Rep. of Germany, assignor to Puma-Sportschunfabriken Rudolf Dassler KG, Fed. Rep. of Germany

Filed Oct. 24, 1984, Ser. No. 664,434

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1983, 3338556

Int. Cl.[4] A43B *13/18*

U.S. Cl. 36—28 20 Claims



1. Sport shoe sole, especially for running shoes of the type having a midsole of shock absorbing material, disposed between an insole made of soft elastic material and an outer sole made of abrasion resistant material, that is provided with vertically oriented damping members therein of harder resiliency characteristics than those of the material of the midsole, wherein the damping members comprise exchangeably insertable damping discs in cylinders and pistons for pressing against the damping discs, each piston being received within a respective cylinder and wherein an opening is associated with each cylinder of a size corresponding to the size of the damping discs for enabling exchange and insertion of said damping discs therethrough.

4,616,432

SHOE UPPER WITH LATERAL FASTENING ARRANGEMENT

Richard P. Bunch, Reading, and Lloyd S. Smith, Newton Center, both of Mass., assignors to Converse Inc., North Reading, Mass.

Filed Apr. 24, 1985, Ser. No. 726,504

Int. Cl.[4] A43B *11/00, 23/00*

U.S. Cl. 36—50 10 Claims

1. A shoe comprising:

an upper having a slot disposed along a path, over relatively planar regions of the wearer's foot, such path commencing proximate to the connection of the phalanges with the metatarsus of the wearer's foot and continuing along the

lateral side of the metatarsus to the top of the upper, such slot defining asymmetric lateral and medial panels of the upper, wherein the medial panel overlies the central longitudinal axis of the foot and includes a plurality of bands disposed transverse to such axis, and

fastening means for adjustably fastening the lateral and medial panels to one another so that the tension of fastening the lateral and medial panels together is transmitted along the length of the bands.

4,616,433

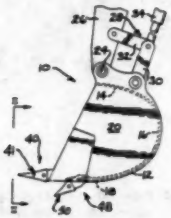
RIPPING BUCKET ARRANGEMENT

Harvey A. Knell, and Lloyd B. Rumble, both of Yorkville, Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Feb. 12, 1985, Ser. No. 700,239

Int. Cl.[4] E02F *3/28*

U.S. Cl. 37—141 T **8 Claims**



6. A bucket arrangement having opposed sidewalls and a bottom portion defining a planar cutting edge extending therebetween and being adapted for movement in a forward direction for excavation of material, comprising:

a first ground engaging tooth assembly defined by each of the sidewalls of the bucket arrangement at a location forward of the connection between said sidewalls and said cutting edge and extending therefrom to a position above said cutting edge; and

a pair of second ground engaging tooth assemblies positioned in a generally straight line along the cutting edge of the bucket arrangement to extend downwardly therefrom at a preselected angle with respect to the first ground engaging teeth and being rearwardly spaced therefrom, said bucket arrangement being selectively operable between a first position wherein only the first ground engaging teeth are engaged with the ground at a location solely subjacent the sidewalls, and a second position wherein only the second ground engaging teeth are engaged with the ground subjacent the area solely between said sidewalls, and a third position wherein said first and second ground engaging teeth are in simultaneous engagement with the ground to permit the grading of the ground to a relatively flat profile.

4,616,434

IRONING TABLE WITH MOUNTING FOR AN IRONING CLOTH

Günther Riba, Rosenbergstr. 26, D-5455 Hardert, and Norbert Cebulla, Neuwied, both of Fed. Rep. of Germany, assignors to Günther Riba, Fed. Rep. of Germany

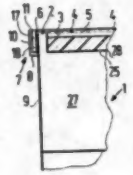
Filed Sep. 4, 1985, Ser. No. 772,383

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1984, 3433170

Int. Cl.[4] D06F *81/14*

U.S. Cl. 38—140 **11 Claims**

1. An ironing table comprising a table surface, and a mounting for an ironing cloth to be stretched thereacross, said ironing cloth having a first lateral edge and an opposite second lateral edge, said mounting comprising engaging means for engaging said first lateral edge of said ironing cloth, said engaging means being located at a first side of said table surface, and an affixing means for affixing said opposite second lateral edge of said ironing cloth, said affixing means being located at a second side of said ironing table which is opposite to and in spaced parallel relationship to said first side, said first engaging means at said first side of the table defining an elongate, rectilinear groove parallel to said first side and a rigid keeper bar corresponding to substantially the cross section of the groove disposed in the groove with an end of the cloth looped about



it to thus anchor said first lateral edge of the cloth, and said affixing means comprising a first securing element at said second side of the table disposed in a downwardly-facing position at the underside of the table and a second securing element attached to the underside of the cloth at the second lateral edge in an upwardly-facing position, said securing elements being releasably interengageable by application of pressure to hold the cloth taut between its ends.

4,616,435

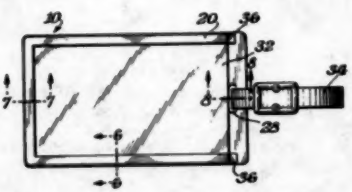
IDENTIFICATION CARD HOLDER

Alan J. Perfect, Crosswicks, N.J., assignor to LaFrance Corporation, Philadelphia, Pa.

Filed Apr. 11, 1984, Ser. No. 599,059

Int. Cl.[4] G09F *3/20*

U.S. Cl. 40—6 **3 Claims**



1. An identification card holder comprising a one-piece molded body member, said body member including a flat base, an integral upstanding inverted L-shaped flange extending along the periphery of three sides of said base, said inverted L-shaped flange including a vertical leg integral with said base and a horizontal leg extending over and generally parallel to said base, said L-shaped flange forming a narrow-three-sided frame above said base with a slot formed between said horizontal leg and said base, the fourth side of said frame being open to provide access to said slot, the area between the three sides of said frame being open with the major part of said base being visible, a transparent shield inserted in said slot through said open side of said frame, said inverted L-shaped flange preventing said shield from being freely removed from said slot except through said open side of said frame whereby an identification card may be inserted against said base and the identification card will be held in place by said shield when the identification card is disposed between said base and said shield with the identification card being visible through said shield, said body member including locking means for preventing said shield from being readily removed from said open side of said frame, means for attaching said holder to another object, said locking means and said attaching means comprising the same elements,

said elements comprising an opening formed in said base member located at said open side of said frame and a securing strap disposed in said opening, a downwardly extending bead located at the periphery of said horizontal leg and in pressure contact with said shield, a ledge on said base and integral therewith, said ledge being located parallel to said horizontal leg to form a three sided open face pocket on said base for receiving an identification card therein, and said shield resting on said ledge with said bead pressing thereagainst, guide surfaces in said slot to guide said shield as it is being inserted to its intended position, said guide surfaces including tapered surfaces at the lead edge of said ledge, a tapered surface at the remote end of said frame, rounded surfaces at the lead edge of said bead, and rounded surfaces on said ledge disposed beneath said tapered surfaces of said frame.

4,616,436

IDENTIFICATION BAND

Irvin S. De Waskin, Highway "M"-P.O. Box 278, Barnhart, Mo. 63012-0278

Filed Jan. 17, 1985, Ser. No. 692,161
Int. Cl.[4] G09F 3/14
U.S. Cl. 40—21 C 10 Claims

1. An identification band, as for hospital patients, comprising a strip adapted to extend around a person's wrist or ankle and to carry identification data, hook and plush fastening elements for fastening the strip around the wrist or ankle, one of said elements forming one side of a loop means at one end of said strip and facing toward the inside of said loop means, the other element being a relatively long and narrow element at the other end of the strip, a protective strip on said other element extending lengthwise thereof secured to said other element adjacent the free end thereof, said other element and the protective strip being adapted to be passed through the loop means to the point where the band encircles the wrist or ankle to the desired extent with said other element facing toward said one element but separated therefrom by said protective strip, whereupon the portion of said other element extending out of the loop means and the protective strip may be removed and the elements pressed together to secure the band around the wrist or ankle, the loop means preventing separation of the elements.

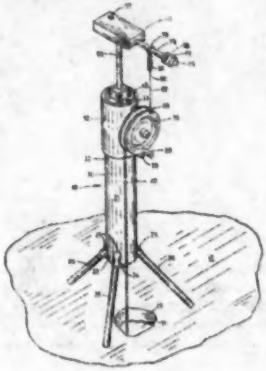
4,616,437

FISHING APPARATUS AND INDICATING DEVICE

Marvin R. Harvey, P.O. Box 1048, Riverton, Wyo. 82501

Filed Oct. 12, 1984, Ser. No. 660,121
Int. Cl.[4] A01K 97/12
U.S. Cl. 43—17 18 Claims

1. A fishing apparatus comprising a tubular housing having an internal chamber and an open end portion facing upwardly when the housing is placed in an operative attitude; means for supporting the housing in the operative attitude; a reel for receiving a fishing line mounted on the housing for rotational movement about an axis of rotation which is substantially horizontal when the housing is in said operative attitude; a closure adapted for removably fitted receipt in the open end portion of the housing in closing relation to the chamber thereof to define a storage area; and an indicating device adapted to be mounted on the closure in said operative attitude for registering movement of the reel, the indicating device including a support adapted to be mounted on the closure in the operative attitude in an upstanding condition and an indicating assembly pivotally mounted on the support for movement between a ready position extending substantially horizontally above the reel and a substantially vertical indicating position and being so balanced as gravitationally to urge the indicating assembly to the indicating position and the indicating device further including a release member adapted to be



mounted on the indicating assembly and releasably to be attached to the reel to retain the indicating assembly in the ready position.

4,616,438

LINE GUIDE FOR FISHING ROD

Ryuichi Ohmura, Shizuoka, Japan, assignor to Fuji Kogyo Co., Ltd., Japan

Filed Nov. 6, 1984, Ser. No. 668,802
Claims priority, application Japan, Dec. 6, 1983, 58-188403[U]
Int. Cl.[4] A01K 87/04
U.S. Cl. 43—24 10 Claims

1. A line guide for a fishing rod comprising a guide ring, a pair of downwardly extending front legs terminating in a front foot, and a pair of downwardly extending rear legs terminating in a rear foot, each of said feet:

(A) having a heel portion and a narrow flexible toe portion extending to said heel, said heel portion being significantly wider than said toe portion, and

(B) having a concave lower surface to essentially mate with the surface of said fishing rod, said concave lower surface extending for the full width of said heel portion.

4,616,439

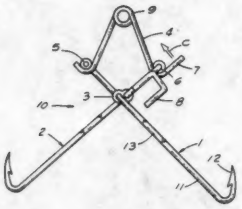
AUTOMATIC FISH HOOK

Jong J. Lee, 4377 Los Angeles Ave., Somis, Calif. 93021

Filed Jul. 2, 1984, Ser. No. 627,342
Int. Cl.[4] A01K 83/02
U.S. Cl. 43—36 1 Claim

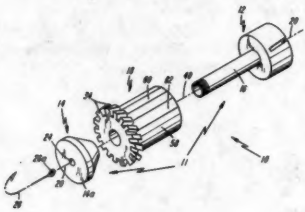
1. A fishhook comprising of two hooks, each having a shaft and movably joined together at the shaft to allow a scissors type motion with the points of the said hooks pointing away from each other, a spring having two extensions, connecting

means for movably attaching respective ends of the extensions to said shafts to allow the force of the spring to forcibly spread apart the said two hooks, and said connection means allowing said spring member to be flexed, after the said two hooks are



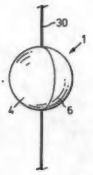
brought together, to a new position roughly perpendicular to the said two hooks, said fishhook holding said spring in said perpendicular configuration until an outside force is introduced which will unflex said spring member and cause the said two hooks to forcibly spread apart away from each other.

4,616,440
FISHING LURE
John P. Millroy, 4300 NE. 18th Ave., Oakland Park, Fla. 33308
Filed Jun. 5, 1984, Ser. No. 618,270
Int. Cl.[4] A01K *85/01*
U.S. Cl. 43—42.12 **4 Claims**



4. A fishing lure, comprising:
(a) a spindle having a longitudinal axis;
(b) means for connecting a fishing line and hook to the spindle so that the fishing line draws the lure through the water;
(c) a first rotor mounted on said spindle for rotation about said axis, said rotor including a plurality of vanes circumferentially arranged thereon so that water can impinge on the vanes to rotate said rotor in a first direction, rotation of the rotor tending to induce co-rotation of the spindle and fishing line in the first direction; and
(d) means for resisting rotation of the spindle, said means including a member fixed to the spindle that deflects water striking the member so that the deflected water creates a force (F) resisting rotation of the spindle in the first direction, said spindle thereby being stationary relative to its axis so that twisting of the fishing line is prevented;
(e) wherein said rotation resisting means includes a generally cylindrical body member fixed to the spindle to establish the forward end of the lure, the body member including a notch formed with a side wall that is offset by a predetermined angle as measured from a plane extending coplanar with said longitudinal axis and intersecting said side wall, whereby water flowing through the notch strikes the side wall to create said force F resisting rotation of the spindle, wherein said spindle is a hollow shaft having a front end attched to the cylindircal body in communication with a first bore extending through the body, and further including a tail piece fixed to the rear end of the hollow shaft, the tail piece including a second bore extending therethrough in communication with the hollow shaft, the fishing line being adapted to pass through the first and second bores and the hollow shaft to locate a fishing hook downstream and in contact with the tail piece, said fishing hook retaining the lure on the line, wherein said cylindrical body member has a generally flat, front face extending orthogonal to said longitudinal axis, three of said notches being peripherally formed in said space at equispaced intervals from each other about the first bore, and further including a pluarlity of third bores formed in said front face to trap air when the lure breaks the water and thereby produce air bubbles when the lure submerges, said air bubbles gradually leaking from the first and third bores into a gap formed between adjacent faces of the rotor and body member, the bubbles discharging from the gap flowing downstream towards the vanes to be agitated thereby.

4,616,441
FISHING FLOAT
Walter Dmytriw, 65 Southport St., Apt. 404, Toronto, Ontario, Canada (M6S 3N6)
Filed Jul. 10, 1985, Ser. No. 753,511
Claims priority, application Canada, Jul. 12, 1984, 458726
Int. Cl.[4] A01K *93/00*
U.S. Cl. 43—44.91 **22 Claims**

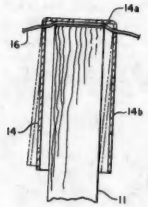


1. A fishing float comprising:
a first body member, which is formed as a shell and includes, along a free edge thereof, a first coupling lip which has a first sealing surface and which coupling lip includes a groove; and
a second body member, which is formed as a shell and includes along a free edge thereof, a second coupling lip, which has a second sealing surface and which coupling lip includes a rib projecting therefrom for engagement with the groove of the first body member;
wherein at least one of the first and second body members is sufficiently resilient to permit engagement of the ribs and groove, and at least two slits are provided in the coupling lips for receiving a fishing line;
whereby, in use, the first and second body members are coupled together with the rib seated in the groove and with the fishing line extending through the two slits and across the float, the first and second sealing surfaces sealing the first and second body members together to form an integral float and to prevent the ingress of water.

4,616,442
PLANT SUPPORT
Phillip M. Lenzner, 6438 Virginia, St. Louis, Mo. 63111
Continuation-in-part of Ser. No. 336,447, Dec. 31, 1981, abandoned. This application Aug. 28, 1984, Ser. No. 645,169
Int. Cl.[4] A01G *17/06*
U.S. Cl. 47—45 **6 Claims**

1. A plant support comprising:
(a) a plant stake having an upper end portion,
(b) a hollow housing having an upper end portion and a lengthwise extending sidewall portion said housing being sized to receive the plant stake therewithin in loosely

fitted relation, the stake upper end portion being engageable by the housing upper end portion and the housing being retained on the stake in liftably removable relation without the need for fasteners, and



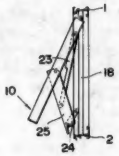
(c) a plurality of flexible straps each having a free distal end, said straps being carried solely by the housing in depending relation for selective attachment to the plant.

4,616,443

REVERSIBLE WINDOW STRUCTURE

Tokio Araki, and Iwao Aoki, both of Toyama, Japan, assignors to Sankyo Aluminium Industry Company Limited, Japan

Filed Dec. 27, 1983, Ser. No. 565,805
Claims priority, application Japan, Oct. 7, 1983, 58-186684
Int. Cl.⁴ E05D *15/30*
U.S. Cl. 49—252 **2 Claims**



1. A reversible window structure comprising:

a window frame assembly comprised of upper and lower window frame members and vertical window frame members defining a rectangular opening;

a sash housed in said window frame assembly comprising upper and lower sash frame members, vertical sash frame members and a rectangular window glass supported by said sash frame members;

complementary guide means mounted on opposite sides of said sash at the upper end thereof adjacent said upper sash frame member and on said vertical window frame members for freely guiding the upper end of said sash for movement along a substantially vertical path; and

support means comprised of a pair of link assemblies each including first and second movable link members pivotably connected at one end thereof to said vertical window frame members adjacent the top and bottom thereof and a third movable link member pivotally connected to the opposite end of said first and second movable link members, said third movable link member being pivotally connected at the middle portion thereof to said opposite end of said first movable link member and being pivotally connected adjacent one end to said opposite end of said second movable link member with the opposite end portion of said third link movable being pivotally connected to said sash at substantially the center of gravity of said sash, whereby upon pivotal movement of said sash about said guide means the pivot connections between said sash and each third link member will move along a substantially horizontal path perpendicular to said vertical path.

4,616,444

RADIO CONTROLLED GATE OPENER

Daniel E. Taylor, Rte. 2, Box 30, Sundance, Wyo. 82729

Filed Jun. 6, 1984, Ser. No. 618,366
Int. Cl.⁴ E05F *11/04*
U.S. Cl. 49—347 **15 Claims**

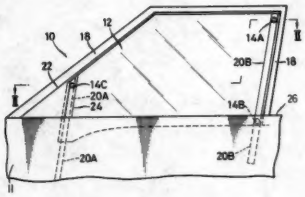
1. Apparatus for operating a swinging gate hinged on a gatepost between open and closed positions comprising a weight, means connecting the weight to the gate for providing movement of the gate in one direction between said positions responsive to falling movement of the weight under gravity, and raising of the weight responsive to movement of the gate in the opposite direction, and powered means connected with the gate for moving the gate in said opposite direction between said positions, thereby raising the weight, and for holding the gate in one of said positions with the weight in raised position.

4,616,445

CONSTRUCTION OF DOOR IN MOTOR VEHICLE

Hiroyuki Watanabe; Eiichi Hamada, both of Toyota; Motomu Hayashi, Okazaki, and Kenji Ono, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jul. 27, 1984, Ser. No. 635,247
Claims priority, application Japan, Jul. 29, 1983, 58-119489[U]
Int. Cl.⁴ E05F *11/38*
U.S. Cl. 49—374 **8 Claims**



1. A vehicle door comprising:

a door section having a door panel and a window frame, said door panel having an inner housing extending between an exterior and an interior of said vehicle when said door section is closed, said inner housing including an opening along an upper surface of said door panel, said window frame being secured to said door section at opposite ends of said opening and defining a window section;

a forward and rearward guide channel secured to said door panel and extending within said inner portion and said window section, at least a portion of said forward and rearward guide channels being aligned in parallel;

a door glass slidably mounted within said window section, at least a portion of said door glass being housed within said inner housing;

means connecting said door glass with said pair of guide channels for slidably mounting said door glass within said window section, said connecting means including guide means for riding within said forward and rearward guide channels and having attachment means secured to said door glass for positioning said door glass in response to movement of said guide means within said forward and rearward guide channels;

bracket means attached to said window frame and including

a forward bracket and a rearwad bracket, said bracket means also including sealing means affixed to said forward and said rearward brackets for providing a substantially airtight seal between said bracket means and said door glass;

a mirror housing and a mirror, said mirror being supporting on said mirror housing; and

means for mounting said mirror housing on the vehicle door to extend along at least said forward bracket, wherein said mirror is positioned rearwardly of said forward bracket and said guide channel as determined relative to the length of the vehicle to prevent an obstructed view of said mirror by a vehicle occupant.

4,616,446

CONSTRUCTION OF DOOR GLASS RUNS IN MOTOR VEHICLE

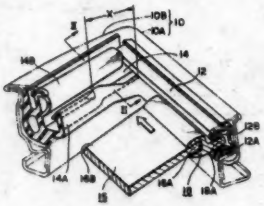
Yuji Okamoto, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Aug. 15, 1985, Ser. No. 766,010

Claims priority, application Japan, Aug. 21, 1984, 59-126869[U]

Int. Cl.[4] E06B 7/16

U.S. Cl. 49—441 8 Claims



1. Construction of door glass runs in a motor vehicle, wherein: there are provided vertical side glass runs and a top side glass run, which are secured to vertical sides and a top side of a door frame, respectively, in vehicle door with said door frame; said vertical side glass runs slidably guide a forward end sliding portion of a slider in the opening or closing direction of a door glass and restrain the forward end sliding portion in the direction of thickness of said door glass, said slider is mounted to end edges of the door glass in the longitudinal direction thereof, and, has said forward end sliding portion shifted into a compartemnt and being of a crank shape in cross section; and said top side glass run has an inner lip for contacting the inner surface of a top end edge of said door glass to seal when said door glass is fully closed; characterized in that said inner lip in said top side glass run is decreased in cross section thereof toward said vertical side glass runs within a range of contacting said slider when said door glass is fully closed, made gradually thinner at the distal ends thereof in wall thickness than the other general portion thereof and thicker at the proximal ends thereof in wall thickness than the other general portion thereof.

4,616,447

METHOD AND APPARATUS FOR MACHINING A WORKPIECE ULTRASONICALLY

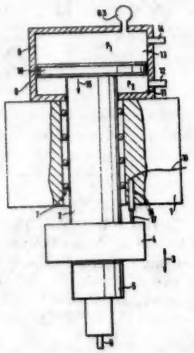
Rudiger Haas, Dunningen; Ernst Krauss, Oberndorf-Aistaig, and Herbert Walter, Fluorn-Winzeln, all of Fed. Rep. of Germany, assignors to Mafell-Sauschinenfabrik Rudolf Mey GmbH & Co. KG, Fed. Rep. of Germany

Filed Feb. 27, 1984, Ser. No. 583,278

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1983, 3306841

Int. Cl.[4] B24B 7/00

U.S. Cl. 51—59 SS 12 Claims



1. A method of machining a workpiece by means of ultrasound using an ultrasonic machine having a tool head for movement toward and away from the workpiece on a feed path, and an ultrasonic machine tool mounted for movement on the tool head and with respect to the tool head toward and away from the workpiece on the feed path, comprising feeding the tool head on the feed path toward the workpiece to establish a contact pressure between the machine tool and the workpiece which is maintained substantially constant, measuring an instantaneous absolute displacement of the machine tool on the tool head in the feed path and from a zero reference point as the machine tool penetrates the workpiece to form a displacement signal corresponding to the instantaneous absolute displacement, using the displacement signal to feed the tool head so as to maintain the substantially constant contact pressure between the machine tool and the workpiece, and repositioning the machine tool to its zero reference point on the tool head by moving the machine tool along the feed path.

4,616,448

AUTOMATIC WORK LOADING DEVICE FOR USE IN GRINDING MACHINE

Tetsuya Nagata, Narashino, Japan, assignor to Seiko Seiki Kabushiki Kaisha, Chiba, Japan

Filed Aug. 22, 1984, Ser. No. 643,062

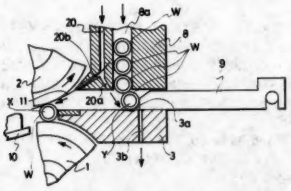
Claims priority, application Japan, Aug. 23, 1983, 58-130182[U]

Int. Cl.[4] B24B 47/22

U.S. Cl. 51—215 H 12 Claims

1. A device for individually transferring workpieces to a working position of a machine, the device comprising: a support member having an upper surface, the upper surface having means therealong defining a workpiece standby position and the upper surface terminating at one end adjacent to a workpiece working position; a loading chute disposed above the support member for receiving a supply of workpieces during use of the device, the loading chute having means for effecting the feeding by gravity of individual workpieces such that the workpieces drop one by one from a loading chute discharge opening onto the support member upper surface at

the standby position so that only one workpiece at a time can occupy the standby position; reciprocable pushing means mounted to undergo reciprocable sliding movement through forward and return strokes relative to the support member upper surface and operable during a forward stroke to push a workpiece from the standby position along the support member upper surface toward the working position while blocking the loading chute discharge opening to prevent another workpiece from dropping from the loading chute into the standby position and operable during a return stroke to unblock the



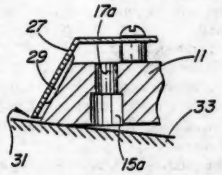
loading chute discharge opening to permit another workpiece to drop from the loading chute into the standby position; and fluid supply means for supplying a pressurized fluid and directing the pressurized fluid in a first fluid stream directed toward the standby position in a direction such that the first fluid stream assists in maintaining a workpiece in the standby position and directing the pressurized fluid in a second fluid stream directed toward the working position in a direction such that the second fluid stream assists the pushing means in transferring a workpiece from the one end of the support member upper surface to the working position.

4,616,449

SUCTION HOUSING FOR VACUUM SANDING DEVICES

Miksa Marton, R.R. #1, Old Castle (Windsor), Ontario, Canada N0R 1L0

Filed Sep. 28, 1984, Ser. No. 656,138
Claims priority, application Spain, Aug. 31, 1984, 535819
Int. Cl.[4] B24B *55/06*
U.S. Cl. 51—273 **9 Claims**



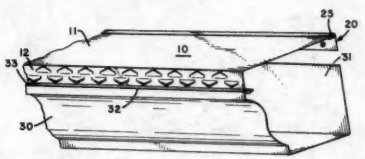
1. A suction plate for a vacuum sander of the type including a backup pad, said suction plate having means for spacing said plate above the upper surface of said backup pad; a depending rim on the periphery of said plate defining a relatively narrow peripheral opening between the inside surface of said rim and the opposing surface of said backup pad; the lower, peripheral edge of said rim being coterminous, or nearly so, with the peripheral edge of the backup pad; said spacing means comprising leg members on the undersurface of said plate; said rim being directed outwardly and downwardly from the plate to define the narrow peripheral opening between said rim and the edge of the backup pad; at least one opening in the upper surface of the plate to provide communication between said peripheral opening and a vacuum source of said sander; and a plurality of projections on said inside surface of said rim to maintain space between the latter and the opposing surface of said backup pad.

4,616,450

EAVES TROUGH/RAIN GUTTER SHIELD

George K. Shouse, 235 South Dr., Hampton, Ga. 30228, assignor to George K. Shouse and Joe B. Newsome, both of Hampton, Ga.

Filed Mar. 5, 1985, Ser. No. 708,499
Int. Cl.[4] E04D *13/00*
U.S. Cl. 52—12 **20 Claims**



1. An eaves trough/rain gutter shield extending lengthwise to cover a length of rain gutter of the type having a longitudinal groove for the collection of rain comprising:

(a) a flat, solid, near horizontal top member having a width slightly larger than the width of the longitudinal groove of the gutter;

(b) a side member connected to said top member and extending substantially vertically downward to an outer top portion of said gutter, with a multiplicity of liquid guidance apertures and a multiplicity of liquid receiving apertures inscribed therein; wherein said liquid guidance apertures are spaced apart in a substantially horizontal upper row; wherein said liquid receiving apertures are spaced apart in a substantially horizontal lower row; wherein each liquid receiving aperture is located below and between two liquid guidance apertures; wherein all edges of said liquid guidance apertures are non-horizontal; wherein all edges of said liquid receiving apertures are non-horizontal; and wherein said each liquid guidance aperture is generally chevron-shaped, having an upper central point located from about 2.38125 mm (3/32 inch) to about 7.9375 mm (5/16 inch) below the juncture of said top member and said side member, with a left barrier edge extending downward and to the left from said point at an angle of from about 30 degrees to about 40 degrees from horizontal a distance of about 9.525 mm (⅜ inch) and then extending vertically downward a distance of about 3.175 mm (⅛ inch), with a right barrier edge extending downward and to the right from said point at an angle of from about 30 degrees to about 40 degrees from horizontal a distance of about 9.525 mm (⅜ inch) and then extending vertically downward a distance of about 3.175 mm (⅛ inch), the material therebetween being bent along a generally horizontal corner extending between the lowermost portions of said barrier edges and extending inward and upward at an angle of from about 30 degrees to about 45 degrees, forming a barrier tab; and

(c) attachment means for attaching said top member and side member above said gutter;

further provided that the outer surfaces of said top member and said side member are pre-weathered to durable, uniformly wettable surfaces.

4,616,451

TELESCOPING ROOF STRUCTURE

Sidney E. Glick, 15 Lafayette La., Cherry Hill, N.J. 08034

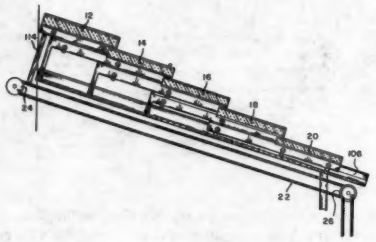
Filed Jun. 3, 1985, Ser. No. 740,258
Int. Cl.[4] E04B *1/346*
U.S. Cl. 52—66 **12 Claims**

1. A movable roof structure comprising:

a plurality of roofing units, each of said roofing units being comprised of at least one extrusion member and a pair of

roofing panels, one of each of said pair of panels being connected to either side of said extrusion member;

wheel and track means carried by each of said extrusion members and being in cooperative relationship with an adjacent extrusion member of an adjacent roofing unit, each of said track means including means for preventing the wheel means from the next adjacent roofing unit from moving upwardly away from each said track means;



said roofing units being movable in telescoping relationship with respect to each other whereby said roof can be moved between an open position and a closed position and including spring biased detent means for maintaining said roofing units in said open and in said closed positions, and means for moving said roofing units.

4,616,452

PREFABRICATED CONSTRUCTIONS AND THEIR COMPONENTS

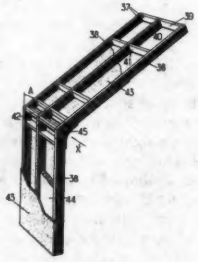
Guy Lemerre, 10 Rue Sadi-Carnot, 14000 Caen, France

Filed Jun. 6, 1984, Ser. No. 617,811

Claims priority, application France, Jun. 6, 1983, 83 09353; Jan. 27, 1984, 84 01323

Int. Cl.[4] E04B *7/00*

U.S. Cl. 52—71 **14 Claims**



1. A prefabricated constructional component for an assembly formed by a flat bent self-supporting panel containing a heat insulating material and adapted to form a vertical section of the assembly,

said panel forming an outer wall pane of the assembly and a roof pane extending from this wall pane upwardly;

characterized in that said panel is in the form of a wooden frame (37) having a closed contour defining said two flat panes (8,9) which are joined together in a V shape,

this wooden frame being defined laterally by two opposed beams made at least partly of bonded laminated wood (38) and bent in a V shape, said beams having an opened out length greater than 5 meters, and each pane of said wooden frame being closed by two flat parallel facings (43) of which at least one is formed from plywood,

and further characterized in that each of the two bent beams (38) which laterally define the wooden frame is formed by an intermediate key made from bonded laminate wood and two straight wood stringers with the bonded laminate wood having laminations inclined with respect to a vertical mean plane of said outer wall pane at an angle equal to one half of an inclination angle of a mean plane of said roof pane, said intermediate key being located between said wood stringers and having a pair of opposed toothed surfaces, and said wood stringers each having a toothed end surface which is assembled to a respective one of said opposed toothed surfaces of said intermediate key by imbricating and sticking to form said bent beam.

4,616,453

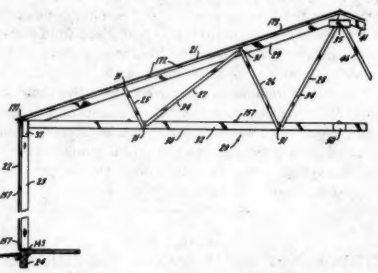
LIGHT GAUGE STEEL BUILDING SYSTEM

Isaac Sheppard, Jr., 1030 W. Elmwood, Clawson, Mich. 48017; Everett Jewell, 1302 Gaston Way, Dallas, N.C. 28034; Steven E. Levitz, 5108 Chestershire Ct., West Bloomfield, Mich. 48033, and Rudolph T. Taylor, 512 N. Vermont, Royal Oak, Mich. 48067

Filed May 20, 1982, Ser. No. 380,446

Int. Cl.[4] E04B *7/02*

U.S. Cl. 52—93 **20 Claims**



1. A light gauge metal building system composed of roll-formed sheet metal structural components and associated fastening means, said system comprising, in combination,

(a) truss means having a plurality of member including top and bottom chords having generally C-shaped crosssection with top and bottom flanges interconnected by substantially flat web sections, the top and bottom chord members being arranged in intersecting relationship to each other with the top flange of the bottom chord being notched to receive the bottom flange and web of an interescting top chord so that the two chords can overlap and be securely fixed to each other with the top and bottom flanges thereof projecting away from the webs in the same direction,

(b) roof means including roll-formed roof purlins for fastening the truss means to one another in spaced apart relation,

(c) a wall system including a plurality of roll-formed generally C-shaped wall studs and a plurality of roll-formed horizontal support girts, each support girt being spaced a predetermined distance from the next one and securely fastened to the wall studs, and

(d) means for connecting the wall system to the roof means where the two intersect.

4,616,454

SLANT SERVICE RIG

John M. Ballachey; Leon V. Jankowski; C. W. Johnson; George S. Ward, all of Calgary, and John R. Ward, Ardmore, all of Canada, assignors to Suncor Inc., Calgary, Canada

Filed Sep. 19, 1985, Ser. No. 777,720

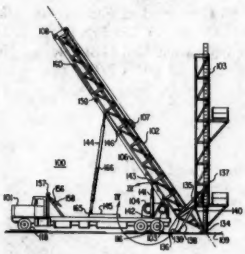
Claims priority, application Canada, Feb. 19, 1985, 474,684

Int. Cl.[4] E04H *12/34*

U.S. Cl. 52—115 **18 Claims**

7. A slant rig comprising a carrier, a mast mounted on said

carrier having a series of attachment points and a base portion, frame members mounted between one of said series of attachment points and said carrier, said mast being rotatable about said one of said series of attachment points and being detachable from said frame members, the length of said mast between



said one of said series of attachment points and said base portion defining a radial distance, said mast being operable to be moved from said one to a second of said series of said attachment points to increase or decrease said radial distance between said base portion and said second of said series of attachment points.

4,616,455

FASTENING ASSEMBLY

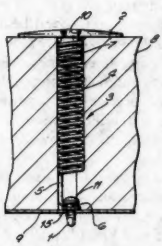
George D. Hewison, Hants, England, assignor to ITW Limited, Windsor, England

Filed Jan. 7, 1985, Ser. No. 689,410

Claims priority, application United Kingdom, Jan. 9, 1984, 8400388; May 25, 1984, 8413277

Int. Cl.[4] E04B *5/00, 7/00;* **F16B** *23/00, 25/00*

U.S. Cl. 52—127.12 **13 Claims**



1. A fastening assembly for fastening a thick insulating layer onto a roof decking, said fastening assembly comprising:

a screw-threaded fastener;

a load distributing plate; and

an extensible resilient element,

said screw-threaded fastener including a shank having a first and second end, a driving head at said first end of said shank, a drill point at said second end of said shank, and a self-tapping screw thread formed around said shank;

said loading distributing plate having a lateral extent substantially greater than said screw-threaded fastener and said extensible resilient element, said plate being adapted to engage an upper surface of said insulation material to hold said insulation material and distribute a fastening load whereby said fastening assembly is prevented from pulling through said insulation material, said plate having a central through opening to allow relation of said screw-threaded fastener by a driving tool extending through said plate;

said extensible resilient element including opposed ends and coupling means located at said opposed ends and coupling said extensible resilient element to said first end of said shank of said screw-threaded fastener and to said load distributing plate, said coupling means permitting said screw-threaded fastener to rotate with respect to said load distributing plate to allow said fastener to be driven through and screw-threaded into said roof decking to fasten said insulation material to said roof decking.

4,616,456

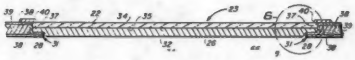
INSULATED WINDOW COVER APPARATUS

Gregory H. Parker, 6450 N. 78th St., #242, Scottsdale, Ariz. 85253

Continuation of Ser. No. 488,261, Apr. 25, 1983, Pat. No. 4,513,548. This application Jan. 9, 1985, Ser. No. 689,861

Int. Cl.[4] E06B *3/26*

U.S. Cl. 52—202 **6 Claims**



1. An insulated window insert apparatus for use in a motor vehicle having at least one window in the top thereof, said at least one window including a window pane and a window pane holder, comprising:

a generally rectangular sheet of support material for blocking out light from the sun;

insulation means operably disposed proximate said sheet of support material for insulating an interior of said motor vehicle from external temperature conditions; and

means for covering said generally rectangular sheet of support material and said insulation means, said covering means including a bottom portion having a surface which is substantially consistent with said motor vehicle interior for aesthetic purposes and the like, wherein said sheet of support material includes a relatively resilient material capable of flexing and includes apparatus for removably attaching said insert apparatus near the periphery of said window, said insert apparatus being attached beneath said window pane.

4,616,457

ENHANCED SAFETY FLUE CONSTRUCTION

Andrew H. Yoder, Fair Play, S.C., and Richard A. Rhodes, Harrisonburg, Va., assignors to KemStone Manufacturing, Inc., Waynesboro, Va.

Filed Oct. 4, 1985, Ser. No. 784,655

Int. Cl.[4] E04H *12/28*

U.S. Cl. 52—218 **20 Claims**

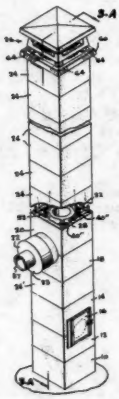
10. A chimney block comprising:

block having parallel upper and lower surfaces and comprising a discrete outer block component and a discrete inner block component, said inner block component comprising a central combustion gas conduit having an outer surface;

said outer block component including outwardly positioned cool air downflow passageways, inner cool air upflow conduits defined by substantially the entire outer surface of the central combustion gas conduit and an inner surface of the outer block component;

the outer block component also including four exterior vertical side panels joined at vertical edges to define corners as viewed from above to define a quadrilateral outer plan periphery and vertical internal diagonal panels bridging adjacent corners and having inwardly facing surfaces which define a smaller approximately quadrilateral shaped opening in which said central combustion gas conduit is positioned and wherein said central combustion gas conduit includes tapered V-shaped vertical positioning ridges

extending into mating slots in said diagonal panels and wherein said cool air downflow passageways comprise a space outwardly of each diagonal panel and inwardly of the corner bridged by each such diagonal panel.



4,616,458

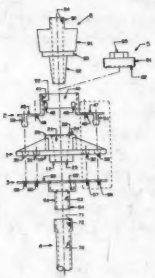
PROTECTIVE APPARATUS FOR TENDONS IN TENDON TENSIONING ANCHOR ASSEMBLIES

Edgar A. Davis, San Jose; Rose M. Dexter, Los Gatos, and John D. McCarthy, San Jose, all of Calif., assignors to VSL Corporation, Los Gatos, Calif.

Filed Jul. 1, 1985, Ser. No. 750,293

Int. Cl.[4] E04C *3/26, 5/08*

U.S. Cl. 52—230 **14 Claims**



1. A protective apparatus for protecting an exposed end of a tendon in a tendon tensioning anchor plate having a base member and a tubular member extending from said base member with a central bore located therein, comprising:

a top member having a collar with a central bore located therein, said central bore of said collar having a predetermined inside diameter for permitting said collar to be closely fitted over and around said tubular member of said anchor plate;

means insertable within said collar for covering one end of said bore in said tubular member in said plate in a watertight fashion;

a bottom member having a hollow tubular member extending therefrom with a central bore located therein for use in forming a watertight seal with a tendon inserted therein; and

means insertable through a hole in said base member of said anchor plate for attaching said top and bottom members together with said anchor plate located therebetween.

4,616,459

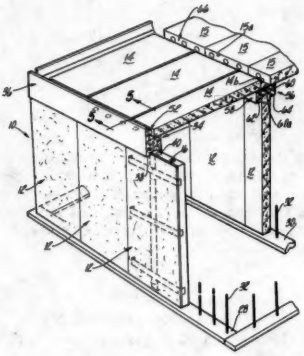
BUILDING CONSTRUCTION USING HOLLOW CORE WALL

Calvin Shubow, 30995 Hunter's Dr., Farmington, Mich. 48024

Continuation-in-part of Ser. No. 268,598, May 29, 1981, Pat. No. 4,461,130. This application Jun. 11, 1984, Ser. No. 619,627

Int. Cl.[4] E04H *1/00*

U.S. Cl. 52—309.12 **17 Claims**



1. A building construction comprising:

(A) at least one precast concrete wall slab positioned vertically and having a plurality of generally parallel core channels extending vertically therethrough from the lower edge thereof to the upper edge thereof between opposite side faces thereof;

(B) at least one precast concrete bond beam positioned on and extending generally horizontally along the top edge of said wall slab and having at least one core channel extending vertically therethrough and aligned with a selected core channel in said precast slab to form a continuous vertical core passage extending from the upper face of said bond beam substantially to the lower edge of said wall slab;

(C) a vertically extending reinforcing rod positioned in said continuous core passage and extending within said core passage from substantially the lower edge of said wall slab to the upper face of said bond beam;

(D) poured concrete filling said core channel in said precast bond beam to lock said reinforcing rod to said bond beam and filling said core channel in said precast slab to lock said reinforcing rod to said precast slab and form a concrete, rod-reinforced column extending from substantially the lower edge of said wall slab to the upper face of said bond beam; and

(E) at least one precast concrete floor slab extending horizontally and at right angles with respect to the plane of said wall slab and resting at one end thereof on said bond beam with its vertical end edge disposed intermediate the width of said bond beam.

4,616,460

ELASTOMERIC GLANDS

John D. Nicholas, Tucker, Ga., assignor to MM Systems Corporation, Tucker, Ga.

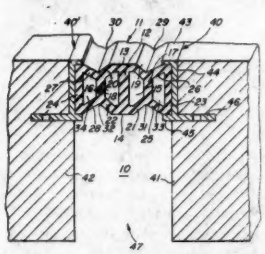
Filed Dec. 3, 1985, Ser. No. 804,046

Int. Cl.[4] E01C *11/10;* **F16J** *15/10*

U.S. Cl. 52—396 **18 Claims**

1. An elastomeric gland for use inside a movement tolerance

space between relatively movable bodies, said gland comprising: a generally octagonal wall member tubular longitudinally of said gland and an intermediate strut wall interconnecting a first pair of side walls of said octagonal wall member medially of said first pair of side walls inside said octagonal wall member thereby producing an I-beam aspect with said first pair of side walls prior to said octagonal wall member being compressed, a second pair of side walls of said octagonal wall member being spaced oppositely of said intermediate strut wall from opposite sides of said intermediate strut wall, and opposite lateral ends of said first and second pairs of side wall of said octagonal wall member being interconnected by third and fourth pairs of side walls of said octagonal wall member; and side end and slanted connecting structure including, opposite side end means to be against said relatively movable bodies when said gland is inside said movement tolerance space, and two pairs of slanted intermediate connecting walls interconnecting said second pair of side walls of said octagonal wall member and said opposite side end means, and said slanted intermediate connecting walls being spaced outwardly apart from one another in said pairs a progressively increased distance leading from said octagonal wall member, for supporting said octagonal wall member and transmitting thrust to move said second pair of side walls of said octagonal wall member toward said intermediate strut wall having said third and fourth pairs of side walls of said octagonal wall member flex reaching from said opposite lateral ends of said first pair of side walls of said octagonal wall member and ultimately, when said octagonal wall member is fully compressed, be in contact with said intermediate strut wall along with said second pair of side walls of said octagonal wall member, with said intermediate strut walls and said first pair of side walls of said octagonal wall member still appreciably preserving said I-beam aspect.

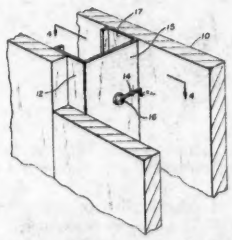


4,616,461

WALL PANEL ATTACHMENT HOOK

Alan C. Wendt, Barrington, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Dec. 30, 1983, Ser. No. 566,912
Int. Cl.⁴ E04B 5/52
U.S. Cl. 52—481 **3 Claims**



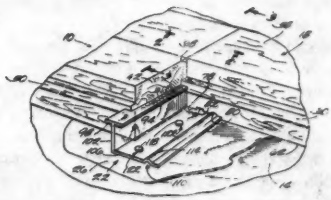
1. A wall construction system comprising in combination an aligned row of contiguous panels, a plurality of vertical studs disposed in abutting relationship with the panels at the joints between said contiguous panels and at intermediate locations between the joints, and a wire hook which attaches a panel to an intermediate stud, said hook comprising a shank juxtaposed against an intermediate stud face normal to a panel and fastened to said face and an arcuate talon curving into the core of a panel from the juncture of the stud and the panel.

4,616,462

FASTENER FOR FLOORING SYSTEMS

Carl W. Abendroth, 210 Crystal Ave., Crystal Falls, Mich. 49920

Filed Oct. 1, 1984, Ser. No. 656,699
Int. Cl.⁴ E04C 1/40; E04B 2/04
U.S. Cl. 52—509 **15 Claims**



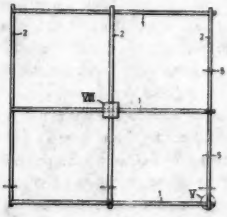
1. A flooring system comprising a foundation, a plurality of adjacent floorboards, each of said floorboards including a generally vertical side including a generally horizontal slot, and a base adjacent said foundation and including therein an opening spaced from said side, a clip including a generally horizontal upper portion received in said slot in one of said floorboards, a generally vertical portion, a lower generally horizontal base portion extending between said foundation and said base of said one floorboard, and a projection extending outwardly on said base portion, and a fastener in said base portion of said clip for securing said clip to said foundation, said fastener including a head projecting above said base position of said clip and received in said opening in said one of said floorboards.

4,616,463

SUSPENDED CEILING

Heinz Kagemann, Am Heidekamp 7, D-3380 Goslar 1, Fed. Rep. of Germany

Filed Nov. 28, 1984, Ser. No. 675,962
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1983, 3343468
Int. Cl.⁴ E04B 5/52
U.S. Cl. 52—665 **12 Claims**



1. A dropped ceiling, comprising:
a plurality of upper and a plurality of lower crosspiece elements having, respectively, top and bottom edges and being adapted to cooperatingly interact in crossing and

edgewise position with respect to one another for forming a grid with open spaces which in comparison with the dimensions of said crosspiece elements are relatively large, said crosspiece elements including respective slot-like transverse apertures which extend in opposite senses in the two pluralities of said elements, in each case over approximately half the height of the associated crosspiece element and with adjacent ones of said apertures in each cross piece element disposed at a distance from each other corresponding to the desired grid dimension of the ceiling, so as to interconnect said elements by way of a cross-lap or like joint;

each of said crosspiece elements having the structure of a hollow chamber profile made of synthetic plastic material, with each chamber extending in the longitudinal direction of the respective crosspiece element;

at least said top edge of each upper and lower crosspiece element being provided at least in part with at least one upwardly directed opening extending longitudinally of that element, the uppermost portion of each of the two lateral walls of each upper and lower crosspiece element that define the boundaries of the uppermost chamber of that crosspiece element being bent over and down into said uppermost chamber thereof in substantially parallel relation to each other and said walls to define between the two bent down wall portions a space constituting said at least one opening, and each bent down wall portion being spaced from the adjacent remainder of the same wall to define therebetween a respective downwardly open recess;

a plurality of attachment members adapted to be releasably interconnected with said upper crosspiece elements and to be moved along the latter, each attachment member including a suspension rod having a lower end and carrying at said lower end an adapter constructed for insertion into a respective opening of a respective crosspiece element, and said adapters being operable to coact with the down-turned edges of the associated bent down wall portions to firmly suspend said upper crosspiece elements from said attachment members; and

a plurality of bridge components each adapted to be located at a respective crossing region of an upper and a lower crosspiece element, each of said bridge components including a plate which at least corresponds in width to the width of the lower crosspiece element and has at least two projecting parts depending therefrom, each projecting part having a narrow portion carried by said plate and a wide portion carried by said narrow portion, and the thickness of each of said narrow portions being somewhat less and the thickness of each of said wide portions being somewhat greater than the width of said at least one opening between said bent down wall portions of said lower crosspiece element, whereby with said bridge components being disposed across the respective crossing regions of said upper and said lower crosspiece elements, transversely of and above the former and longitudinal of and above the latter, said wide portions of the associated projecting parts can be inserted into the respective openings of said lower crosspiece elements with a snap fit to underlie the lowermost edges of the associated bent down wall portions and firmly secure said lower crosspiece elements to said upper crosspiece elements.

4,616,464

COMPOSITE FIRE-RESISTANT CONCRETE/STEEL COLUMN OR POST

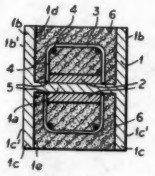
Jean-Baptiste Schleich, Kockelscheuer; Erwin Lahoda, Dahlem, and Jean-Paul Lickes, Kayl, all of Luxembourg, assignors to Arbed S.A., Luxembourg, Luxembourg

Filed Aug. 9, 1984, Ser. No. 639,375

Claims priority, application Luxembourg, Aug. 12, 1983, 84966

Int. Cl.[4] E04C *3/34*

U.S. Cl. 52—723 **19 Claims**



1. A fire-resistant composite structural element, comprising:

a one-piece steel structural shape comprising at least one pair of flanges bridged by a web having a web surface and defining between said flanges a channel;

a flat steel plate having a plate surface affixed to the web surface and extending over at least part of the length of said structural shape within said channel, the plate being completely out of contact with the flanges and having opposite edges spaced inward from the respective flanges;

steel reinforcement secured substantially only to the plate; and

a body of concrete at least partially filling said channel, imbedding the reinforcement, and affixed to said structural shape while enclosing said plate and filling between the plate edges and said flanges, outer surfaces of said flanges being free from concrete covering.

4,616,465

STORAGE VESSEL AND METHOD OF ASSEMBLY

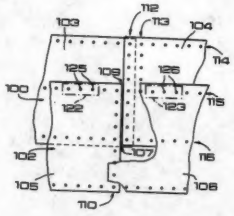
Stuart D. Byers, and John F. Clark, both of Mississauga, Canada, assignors to Crophandling Systems Limited, Mississauga, Canada

Continuation-in-part of Ser. No. 516,987, Jul. 25, 1983. This application Jul. 27, 1984, Ser. No. 635,049

Claims priority, application Canada, Mar. 22, 1983, 1,193,821

Int. Cl.[4] E04B *1/32*; B65D *90/02*

U.S. Cl. 52—748 **5 Claims**



1. A method of building a cylindrical storage vessel from a plurality of flangeless plates, which comprises the following steps:

(a) providing a foundation plinth of concrete cast into a first ring of steel plates having inner and outer surfaces;

(b) forming on the plinth a second row of rectangular steel plates, each having respective upper margins, lower margins, and right-hand and left-hand edges and edge mar-

gins, and inner and outer surfaces, into a continuous ring by overlapping and bolting together right-hand and left-hand edge margins, respectively, of adjacent plates so as to have surface to surface contact in the overlapped region between adjacent pairs of plates;

(c) raising said second ring just formed using lifting jacks, and similarly forming on the plinth a further row of similar rectangular steel plates into a continuous ring;

(d) said second and all further rings of plates being raised in such a manner that the upper margins of the plates in a lower ring overlap the lower margins of the plates in a next successive higher ring of plates; so as to have surface to surface contact in the overlapped region between adjacent rings of plates;

(e) positioning said second and all further rings of plates so that the plates in each ring are staggered with respect to the plates in the next successive higher ring of plates so that an upper portion of one side edge of each of said plates in a first ring of plates is in direct edge to edge abutment with a lower portion of the opposite side edge of each of said plates in the next successive higher ring of plates respectively;

(f) bolting all of said overlapped regions together; and

(g) repeating steps (c) to (f) until the required number of rings of plates have been formed and assembled one to another; and wherein:

in step (d), and for at least two adjacent lower and higher rings of plates, said adjacent rings are so positioned that the extent of the surface to surface contact between the upper margins of the plates of the lower ring of said at least two adjacent rings of plates and of the lower margins of the higher ring of said at least two adjacent rings of plates is more than half of the vertical height of each of said plates.

4,616,466

CAPPING APPARATUS

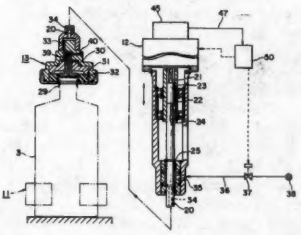
Hideo Tanaka, and Shiaru Muranaka, both of Kanazawa, Japan, assignors to Shibuya Kogyo Co., Ltd., Japan

Filed Nov. 8, 1984, Ser. No. 670,429

Claims priority, application Japan, Nov. 15, 1983, 58-214428

Int. Cl.⁴ B67B *3/20*; B65B *7/28*

U.S. Cl. 53—75 **3 Claims**



1. Apparatus for capping a container by having a cap screwed onto a mouth portion of said container at a predetermined tightening torque, comprising:

carrier means for carrying thereon said container along a predetermined path;

holding means for releasably holding a cap to be applied to said container, said holding means being movable between an inoperative position where said holding means is located away from said container and an operative position where said holding means is located closer to said container for applying said cap to said container;

torque applying means for applying a torque to said holding means when said holding means is located at said operative position; and

control means for controlling the level of said torque applied to said holding means such that during a first stage of capping, said torque has a first level high enough to achieve proper orientation of said cap on said container, during a second stage subsequent to said first stage said torque has a second level which is lower than said predetermined tightening torque, and during a third stage subsequent to said second stage, said torque has said predetermined tightening torque level.

4,616,467

MACHINE FOR INSERTING TABS IN CONTAINER PACKS

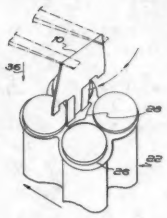
Michael Brain, 72 Holmwood Avenue, Leeds LS64NJ; Richard D. Wade, "Badgerstone", Langford Ride, Borley in Wharedale, Yorkshire, and Brian Barker, 2 Church Lane, Corringham, Gainsborough Lincs DN215RA, all of England

Filed May 18, 1984, Ser. No. 612,108

Claims priority, application United Kingdom, May 21, 1983, 8314146

Int. Cl.⁴ B65B *61/14*

U.S. Cl. 53—134 **18 Claims**



1. A machine for inserting a tab in an assembly of containers held together by a holding device which has at least one aperture comprising:

(a) means for folding in two a cut and creased blank which forms the tab;

(b) means for folding flaps of the blank onto tongues of the blank;

(c) means for inserting the tongues and folded flaps of the blank into said aperture or apertures in the holding device so that the flaps will spring outwardly and engage under the holding device connecting the tab to the assembly;

(d) means for effecting the above operations on a repeating basis so that tabs are sequentially erected and inserted in respective assemblies which travel as a queue relative to the means for inserting; and

(e) means for transporting the blank after the folding steps (a) and (b) from a receiving station of the means for transporting to the inserting means, wherein said means for transporting comprises a rotatable drum having angularly arranged holders for respective blanks, said holders each comprising a pair of radially arranged plates.

4,616,468

HARVESTING/PACKING SYSTEM

Miguel A. Munoz, 248 E. Gillett Rd., El Centro, Calif. 92243

Filed Jun. 7, 1984, Ser. No. 618,338

Int. Cl.⁴ A01D *67/00*; B65B *67/00*

U.S. Cl. 53—391 **26 Claims**

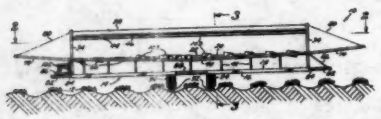
1. For the harvesting and packing or produce grown in low rows, a moveable on-site harvesting/packing plant comprising:

a frame elevated above and transversely extensive over said crop rows and moveable along said rows,

said frame supporting a floor area and table area elevated relative to said floor area,

said frame defining discrete work stations of said plant, said work stations comprising a picking station, a station for the assembly of packing boxes, and a packing station,

said picking station comprising said table area and a pair of inclined transverse wings extending laterally outwardly and upwardly from opposite sides of said table area, whereby pickers walking along with said plant as it is



being moved along said crop rows may place harvested produce on said table area and on said wings, and such produce placed on said wings will roll down said wings onto said table area owing to the incline of said wings.

4,616,469

METHOD FOR PRODUCING A PACKAGE

Öystein Skalleberg, Järfälla, Sweden, assignor to Skaltek AB, Kungsangen, Sweden

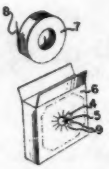
PCT No. PCT/SE81/00124, § 371 Date Jan. 20, 1982, § 102(e) Date Jan. 20, 1982, PCT Pub. No. WO81/03319, PCT Pub. Date Nov. 26, 1981

Continuation of Ser. No. 346,069, Jan. 20, 1982, abandoned. This PCT application Apr. 24, 1981, Ser. No. 732,904

Claims priority, application Sweden, May 21, 1980, 8003826

Int. Cl.[4] B65B *61/00*

U.S. Cl. 53—410 **6 Claims**



1. In the packaging of an elongated article, especially a length of electrical cable (8), wherein the elongated article is provided in a coiled or ring form (7) of a given outer radius and having a center opening therein, a method of packaging such elongated article to permit alternative modes of dispensing the elongated article comprising:

(a) providing a pair of substantially square, flat panels of selfsupporting rigidity;

(b) providing each said panel with a line of perforation continuously encompassing a portion of the respective panel having a radius at least as great as said given radius;

(c) orienting said panels in spaced, substantially parallel relationship and introducing a ring (7) of such elongated article, without a central core support in its center opening, between said parallel panels with the center axis of the ring (7) substantially perpendicular to said panels;

(d) subsequently introducing a substantially tubular means (10) through said encompassed portion of each of said parallel panels and the intervening center opening of the ring (7) disposed therebetween; and

(e) releasably securing said tubular means (10) in the introduced position in relation to the ring (7) and said parallel panels to provide a central core support for supporting the ring (7) with respect to the parallel panels whereby the contents of the ring (7) may be subsequently removed from the ring either by breaking out the portions of said panels within the confines of said perforations to form a reel on which the ring (7) is coiled for access to the outermost turns of the ring (7) or by removing said tubular means from the ring (7) and said panels for access to the innermost turns of the ring (7).

4,616,470

METHOD OF FORMING RE-SEALABLE DISPENSER-CONTAINER

Konji Nakamura, 3-7, Nishiawaji 6-chome, Higashiyodogawa-ku, Osaka, Japan

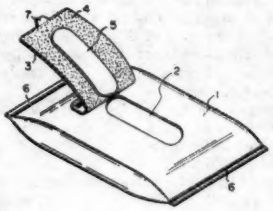
Continuation of Ser. No. 320,553, Nov. 12, 1981, Pat. No. 4,538,396. This application Dec. 18, 1984, Ser. No. 683,178

Claims priority, application Japan, Dec. 3, 1979, 54-156676; Dec. 3, 1979, 54-167459[U]; May 22, 1980, 55-70397[U]; Aug. 13, 1980, 55-111380

The portion of the term of this patent subsequent to Sep. 3, 2002, has been disclaimed.

Int. Cl.[4] B65B *61/18*

U.S. Cl. 53—412 **3 Claims**



1. A continuous process for producing from a continuous flexible sheet a re-sealable dispenser container formed in a rectangular shape and having at least one opening, and being wrapped around a plurality of solid sheet-like materials for cosmetic or toilet use contained therein, comprising the steps of:

continuously feeding said continuous flexible sheet of impervious material in a substantially horizontal plane;

periodically weakening a line drawn in a closed elongated shape at a central portion in said continuous flexible sheet;

periodically disposing a flexible flap from above, the flap having an adhesive surface covering substantially one entire side of the flap, the flap also having an uncoated tab, on the upper surface of said continuous sheet in such a manner that the flap contacts the upper surface of said sheet and covers said weakening line, adhering the adhesive surface of said flap to the surface of said elongated shape;

periodically fixing one end portion of said flap to said continuous sheet;

guiding said continuous sheet by means of a guide unit comprising a plurality of guide rollers to invert said continuous sheet such that the lower surface becomes the new upper surface;

continuously moving said continuous sheet in a substantially horizontal plane;

periodically disposing said sheet-like materials for cosmetic or toilet use on the new upper surface of said continuous sheet at a position corresponding to said flap when the continuous sheet is moved in said substantially horizontal plane;

said weakening, flap disposing and fixing steps being continuously performed on said continuously running sheet;

continuously wrapping said continuous sheet around said sheet-like materials for cosmetic or toilet use with the continuous sheet so folded that longitudinal edges of said continuous sheet are brought together upon each other at the central portion of said continuous sheet;

continuously heat sealing the longitudinal edges of the continuous sheet to each other to form a continuous longitudinal heat seal and heat sealing said sheet transversely to form a succession of transversely sealed portions; and

periodically cutting said continuous sheet at said transversely sealed portions to provide a plurality of separate re-sealable dispenser containers.

4,616,471
METHOD OF PACKAGING A PALLET-SUPPORTED STACK OF GOODS

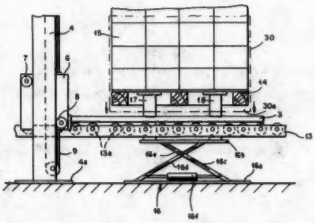
Reiner W. Hannen, Goch, Fed. Rep. of Germany, assignor to MSK-verpackungs-Systeme Gesellschaft mit beschrankter Haftung, Kleve, Fed. Rep. of Germany

Filed Aug. 3, 1984, Ser. No. 637,522

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1983, 3327996

Int. Cl.[4] B65B *53/06*

U.S. Cl. 53—442 **3 Claims**



1. A method of tightly packaging a load including a stack of goods mounted on a pallet, comprising the steps of:

(a) moving the load to be packaged onto a supporting surface inside a heating zone;

(b) elevating said load above said supporting surface;

(c) pulling a hood of heat-shrinkable plastic foil from above over the elevated load, with a lower rim of said hood projecting downward below the underside of said pallet;

(d) initially blowing hot gases substantially only against the lower hood rim from an annular burner surrounding the rim in the heating zone and thereby heating only said lower rim to shrinking temperature for contracting same around the periphery of said pallet;

(e) with said rim still at substantially shrinking temperature clamping bent-over portions thereof against the underside of said pallet; and

(f) only thereafter shrinking the remainder of said hood around said load by raising the annular burner up around the load.

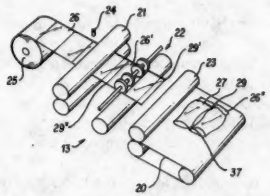
4,616,472
METHOD AND APPARATUS FOR LOADING SIDE-SEAL BAGS

Joseph E. Owensby, Spartanburg; Frederick A. Dobbins, Lyman, and Billy W. Austin, Duncan, all of S.C., assignors to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Filed Oct. 10, 1985, Ser. No. 786,383

Int. Cl.[4] B65B *43/34, 43/36, 43/16, 43/22*

U.S. Cl. 53—459 **10 Claims**



1. A method of simultaneously loading products into each bag in a plurality of bags comprising the steps of:

(a) providing a chain of individually separable side-seal bags, each bag having a lip which can be gripped so that the mouth of the bag is unobstructed and can be readily opened;

(b) feeding a plurality of bags from the chain, the plurality lying in a first horizontal plane;

(c) separating the plurality of bags from the chain and partially separating the bags within the plurality from each other;

(d) advancing said plurality of bags to a product loading station;

(e) holding said plurality in the first horizontal plane at the loading station while the immediately preceding plurality of bags is being loaded;

(f) gripping the lip of each of the bags in the plurality so that the mouths of the bags are not obstructed;

(g) after the preceding bags have been loaded and removed, moving the plurality of bags upwardly to a second horizontal plane;

(h) opening each of the plurality of bags with a stream of air;

(i) guiding a product into each bag; and,

(j) removing the plurality of loaded bags from the loading station and separating each bag in the plurality from the other.

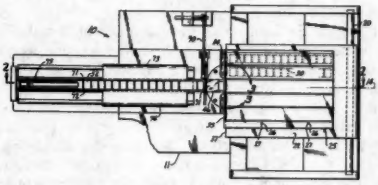
4,616,473
APPARATUS TO PLACE MICROFILM FRAMES IN JACKETS

Paul L. Hodges, Claremont, and David R. Duerr, Sugarloaf, both of Calif., assignors to Data Conversion Inc., Pomona, Calif.

Filed Aug. 16, 1985, Ser. No. 766,771

Int. Cl.[4] B65B *63/00, 43/26*

U.S. Cl. 53—520 **7 Claims**



1. In apparatus for inserting microfilm frames into a jacket, said jacket being the type having a top and bottom sheet joined to ribs at spaced intervals to leave between them channels having a width for containing microfilm frames, there being an entry slot through one of said sheets for each channel, each microfilm frame having a width somewhat less than the width of the channel, said microfilm frames being initially intended for individual or plural insertion into one or more of said channels, said apparatus including projection means to project an individual microfilm frame, a platform to support a jacket into which a microfilm frame is to be inserted, and a cutter to sever the strip at a selected location, the improvement comprising:

a feed structure having a guide passage therethrough, with which a channel of the jacket will be aligned when a microfilm frame(s) is to be inserted, said guide passage having transverse dimensions such as to guide the microfilm frame along a path toward said channel;

a strip passage and a pusher passage, both smoothly merging with said guide passage and intersecting one another at a junction to form an acute angle between them;

grip means slidably mounted in said strip passage, adapted to grip an end of a strip which is slidably fitted in said strip passage so as to move it toward and away from said guide passage; and

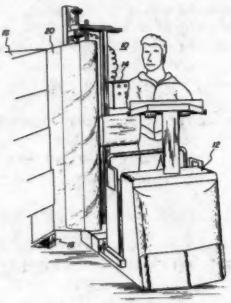
a pusher member slidably fitted in said pusher passage and adapted to press against the end of a microfilm frame(s) which is disposed in said guide passage, said strip and said pusher member mutually excluding the other from said guide passage when present at said junction.

4,616,474

MOBILE FILM WRAPPING APPARATUS

Edmond Morley, Chester; Neil DiLorenzo, Campbell Hall, and James Karras, Kerhonkson, all of N.Y., assignors to Wrap & Roll, Inc., Fort Lee, N.J.

Filed Apr. 25, 1985, Ser. No. 727,374
Int. Cl.[4] B65B *13/10*
U.S. Cl. 53—556 4 Claims



1. Mobile film wrapping apparatus for dispensing heated stretchable film and rapidly wrapping the film about stationary goods, comprising:

first means for holding a supply roll of stretchable film in a substantially vertical orientation for film dispensing, said first means being adjustable to accommodate film rolls of different heights;

second means for controlling the speed at which said film is dispensed from said supply roll, said second means comprising an electrically powered adjustable tension brake;

a self-contained heated roller, about which the film from the supply roll is partially wound, for heating said film to facilitate stretching of said film prior to the film being wrapped around said goods, said heated roller being at least partially DC powered and mounted for rotation about a substantially vertical axis, said rotation resulting from contact with said film;

said heated roller comprising: a hollow cylindrical tube constructed of heat conducting material having a top end cap and a bottom end cap, the tube and end caps forming an interior cavity which serves as a reservoir for heating fluid, a heating element mounted within said cavity for immersion in said fluid, said heating element comprising a first DC heating element and a second auxiliary AC heating element, said auxiliary heating element being selectively connectable to an AC power source for rapid heat-up of the fluid, and a thermostatic switch mounted within said cavity for sensing the temperature of the fluid, said heating elements and thermostatic switch being rotatable along with said tube about said substantially vertical axis;

relay means for activating said DC heating element when said thermostatic switch senses that the temperature of the fluid has fallen below a preselected level, said relay means simultaneously activating said AC heating element when said AC heating element is connected to an AC power source;

an upper shaft attached to said top end cap and extending upwardly therefrom and a lower shaft attached to said bottom end cap and extending downwardly threfrom, said shafts cooperating with bearing units mounted on a common support means to permit said tube to freely rotate about said substantially vertical axis, and a slip-ring assembly associated with one of said shafts for connecting the DC heating element and thermostatic switch within said tube to an electric power supply;

common support means for supporting said first means, second means and said heated roller;

third means for attaching said common support means to a self-propelled vehicle; and

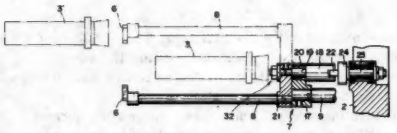
a self-propelled, operator driven vehicle, said vehicle being powered by a DC power source, said DC power source also supplying power to said tension brake, said DC heating element and said thermostatic switch, whereby goods can be rapidly wrapped with prestretched film under tension by driving said vehicle and attached film wrapping apparatus around said goods.

4,616,475

PACKAGE FORMING APPARATUS

Tomizou Nagata, Tokyo, Japan, assignor to The Japan Tobacco & Salt Public Corporation, Tokyo, Japan

Filed Feb. 27, 1985, Ser. No. 706,335
Claims priority, application Japan, May 22, 1984, 59-101729
Int. Cl.[4] B65B *19/24*
U.S. Cl. 53—575 6 Claims



1. A package forming apparatus comprising:

a shaft;

a stationary body for rotatably supporting said shaft;

a rotary drum-like member provided on said shaft for rotation in unison therewith;

a plurality of cylindrical core members provided on said rotary drum-like member for movement in axial and radial directions, sheet material being wound on the outer periphery of said cylindrical core members, said core members being grouped into first and second groups spaced apart from each other in the axial direction of the shaft;

an extension shaft provided on said rotary drum-like member for movement in the axial direction;

a pushing member provided at one end of said extension shaft and capable of being inserted into the core member;

bottom folding means for forming the bottom of a package by folding an end portion of the sheet material wound on said core member in co-operation with said pushing member inserted into said core member;

a sliding shaft provided on said rotary drum-like member for movement in the axial direction;

first driving means for moving said sliding shaft in the axial directions;

an arm member having one end secured to one end of said sliding shaft;

a socket member having an intermediate portion rotatably supported at the other end of said arm member;

second driving means provided for engagement and disengagement with respect to said rotary drum-like member and rotating said socket member when in engagement therewith;

a crank arm having one end secured to one end of said socket member, the other end of said extension shaft being secured to the other end of said socket member;

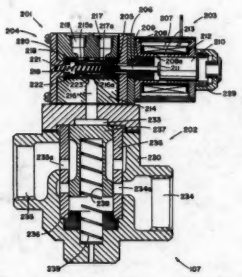
coupling means for snap coupling together said arm member and crank arm at a predetermined rotational positon; and

means for moving the core members of the first and second groups in the axial direction of the shaft to change the positions of the core members to each other.

4,616,476
CYLINDER DRIVING APPARATUS

Naotake Oneyama, Kashiwa, and Akihisa Yoshikawa, Mastudo, both of Japan, assignors to Shokestu Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 266,498, May 22, 1981, abandoned. This application Apr. 12, 1984, Ser. No. 599,592
Claims priority, application Japan, May 30, 1980, 55-76064
Int. Cl.[4] F15B *1/02, 13/043, 13/044*
U.S. Cl. 60—414 **8 Claims**

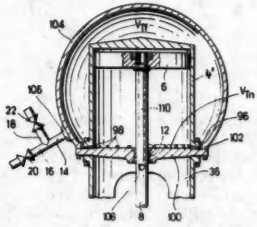


1. A cylinder driving apparatus for driving a load upwardly and downwardly, said cylinder driving apparatus comprising:
(a) a pneumatic cylinder divided into a first chamber and a second chamber by a piston, said cylinder further comprising a load supporting rod operatively connected to said piston, said cylinder being arranged such that an increase in pressure in said first chamber causes the rod to move upwardly and an increase in pressure in said second chamber causes the rod to move downwardly;
(b) a pressure accumulation tank;
(c) means for supplying pressurized air at a selected pressure to said pressure accumulation tank;
(d) a balance pipeway communicating said first chamber to said pressure accumulation tank;
(e) second means for generating a selectively variable first energizing current;
(f) third means for generating a second energizing current;
(g) a first electromagnetic proportional flow control valve operatively disposed in said balance pipeway, said first electromagnetic proportional flow control valve being selectively movable between a first position in which it prevents communication between said first chamber and said pressure accumulation tank and a second position in which it regulates air flow between said first chamber and said pressure accumulation tank in proportion to said first energizing current;
(h) a recycling pipeway communicating said second chamber to said pressure accumulation tank; and
(i) a pressure control valve mechanism operatively disposed in said recycling pipeway, said pressure control valve mechanism being selectively movable in response to said second energizing current between a first position in which it communicates said second chamber with the atmosphere and a second position in which it blocks flow through said recycling pipeway,
wherein said pressure control valve mechanism comprises:
(a) a three-port electromagnetic valve for pneumatic charge and discharge and
(b) a pilot type pressure reduction valve for providing pilot pressure, said pilot type pressure reduction valve including pressure reduction valves set at different pressure levels by a switching valve such that when the load is moved upwardly said three-port electromagnetic valve is energized to place said second chamber in fluid communication with said relief valve, and, during downward movement of the load, said three-port electromagnetic valve is de-energized to communicate said second chamber with pressure from said pressure accumulation tank which is modulated by said pilot pressure,
whereby, during use of said cylinder driving apparatus:
(j) the load supporting rod is moved downwardly by a combination of the air pressure in said second chamber and the force of gravity acting on the load, both of which act against the air pressure in said first chamber, and
(k) a backward pressurized air flow from said first chamber to said pressure accumulation tank during downward movement of the load supporting rod is partially recycled to said second chamber via said recycling pipeway.

4,616,477
PNEUMATIC SERVOMOTOR

Markus Baumeler, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Division of Ser. No. 474,285, Mar. 11, 1983, Pat. No. 4,566,273. This application Jul. 2, 1985, Ser. No. 751,190
Claims priority, application Switzerland, Mar. 17, 1982, 1665
Int. Cl.[4] F15B *11/06*
U.S. Cl. 60—415 **7 Claims**



1. A pneumatic servomotor comprising
a cover;
a cup-shaped cylinder secured to said cover at an open end thereof, said cylinder having a predetermined inside diameter and a plurality of radial grooves at said open end defining apertures having a flow resistance to a given rate of flow or air passing therethrough equivalent to a free cross-sectional area not more than 0.02 times the square of said inside diameter;
a piston slidably mounted in said cylinder to move between a lowered position spaced from said open end to define a first chamber between said cover and said piston and a raised position adjacent a closed end of said cylinder;
a piston rod secured to said piston and passing through said cover, said rod having a bore communicating an upper end face of said piston with the exterior of said cover;
a part-spherical pressure tank secured to said cover about said cylinder to define a second chamber therewith, said chamber being in communication with said first chamber through said radial grooves in said cylinder;
means including a first control valve for controlling a flow of pressurized medium from a source into said second chamber; and
means including a second control valve for controlling a flow of medium from said second chamber to a pressure medium sink.

4,616,478
ROTATABLE HYDROSTATIC TRANSMISSION

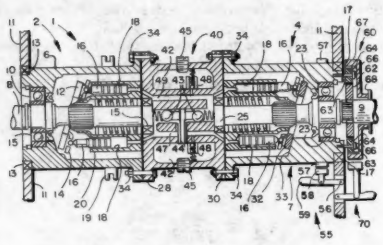
Falle Jensen, 44 W. Del Amo, Long Beach, Calif. 90805

Continuation-in-part of Ser. No. 317,126, Oct. 30, 1981, abandoned. This application Aug. 21, 1984, Ser. No. 643,261
Int. Cl.[4] F16D *39/00*
U.S. Cl. 60—487 **4 Claims**

1. A rotatable hydrostatic transmission comprising:
a hydraulic pump and a hydraulic motor each having a

rotatable housing member at one end and a rotary shaft member at the other end with bearing means supporting said shaft member in said housing member so that said shaft member protrudes from said housing member, and said shaft members and said housing members of said hydraulic pump and said hydraulic motor are all aligned for rotation about a common axis, and wherein one member of said pump is rigidly coupled coaxially with one member of said motor so that said rigidly coupled members rotate together as a unit, and wherein the other member of said pump is an input and the other member of said motor is an output,

a driving input connected to said other member of said pump,



a driven output connected to said other member of said motor,

hydraulic fluid transfer means coupled to allow hydraulic fluid flow between said pump and said motor to accommodate differences in rotational speed between said driving input and said driven output, whereby a hydraulic fluid circulation loop is defined through said transfer means and said hydraulic pump and said hydraulic motor, and said loop is filled with hydraulic fluid,

a hydraulic fluid reservoir means coupled to provide hydraulic fluid to said hydraulic pump and motor through said hydraulic transfer means, and

control means for providing an infinite degree of control of hydraulic fluid flow in said loop.

4,616,479

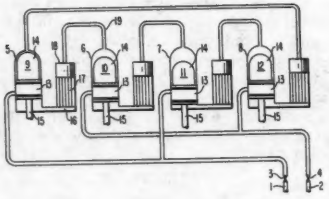
POWER CONTROL SYSTEM FOR A DOUBLE-ACTING HOT GAS ENGINE

Yngve R. Göthberg, Storabackegatan 15 D 216 15, Malmö , Sweden

Filed Nov. 26, 1985, Ser. No. 801,963

Int. Cl.[4] F02G *1/06*

U.S. Cl. 60—521 **3 Claims**



1. A power control system for a double-acting hot gas engine having an even number of working gas charges each of which being limited by reciprocating pistons in two cylinders and each of said pistons being provided with two axially spaced piston rings allowing flow of gas to pass each ring in one direction only

characterized in that a first one of two pistons limiting a working gas charge is provided with piston rings adapted to provide maximum working gas pressure between them, whereas the other one of said two pistons is provided with piston rings adapted to provide minimum working gas pressure between them, a controllable connection being established from a high pressure gas source to the space between the piston rings of said other one of said two pistons, whereas another controllable connection is established from the space between the piston rings of said first one of said two pistons to a low pressure gas source.

4,616,480

CONTROL SYSTEM FOR THE ENGAGEMENT AND DISENGAGEMENT OF AN EXHAUST GAS TURBOCHARGER

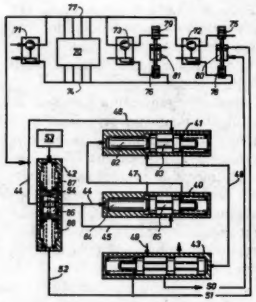
Herbert Deutschmann, Friedrichshafen, and Gerd-Michael Wolters, Markdorf, both of Fed. Rep. of Germany, assignors to MTU Motoren- und Turbinen-Union Friedrichshafen GmbH, Del.X

Filed Aug. 7, 1984, Ser. No. 638,498

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1983, 3335471

Int. Cl.[4] F02B *37/12*

U.S. Cl. 60—600 **11 Claims**



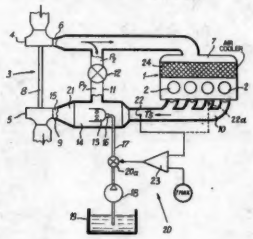
1. A control system for the engagement and disengagement of at least one exhaust has turbocharger means of a piston internal combustion engine having an exhaust-gas and a charging-air line for the exhaust gas turbocharger means, closure means for opening and closing said exhaust-gas and charging-air lines to cause engagement and disengagement of the exhaust-gas turbocharger means, said control system being operable to control a working medium for the actuation of the closure means and being supplied with and responsive to magnitudes of charging air pressure of the piston internal combustion engine in a control line means connected between the internal combustion engine and said control system, said control system comprising means for closing the control like means after each engagement and disengagement of the exhaust gas turbocharger means caused by the closure means and for reopening the control line means after passage of a predeterminable time period.

4,616,481

SUPERCHARGED INTERNAL COMBUSTION ENGINES HAVING A BYPASS CONDUIT AND AN AUXILIARY COMBUSTION CHAMBER WHICH ARE PROVIDED WITH A REGULATING SYSTEM

Jean Melchior; Thierry Andre, both of Paris, and Alain Dourille, Elancourt, all of France, assignors to French State, France

Filed Jan. 29, 1985, Ser. No. 696,217
Claims priority, application France, Jan. 30, 1984, 84 01355
Int. Cl.[4] F02B 37/00
U.S. Cl. 60—606 13 Claims



1. An internal combustion engine having work chambers of variable volume, supercharged by a turbocompressor whose air outlet of the compressor communicates with the air inlet of the work chambers, said compressor being driven by a turbine whose gas inlet is connected to the gas outlet of the work chambers through at least an exhaust manifold, which engine comprises a bypass conduit putting the air outlet of the compressor in communication with the gas inlet of the turbine through an auxiliary combustion chamber which is divided in the upstream to downstream direction into a primary combustion zone and a secondary dilution zone and whose gas outlet communicates with the inlet of the turbine, said primary zone comprising at least one fuel supply nozzle connected to a source of fuel under pressure through fuel flow regulating means for the fuel admitted by said nozzle, said regulating means being responsive to an operating parameter of the engine, wherein said regulating means are so arranged so as to act in the direction for increasing the fuel flow up to a maximum value, if at least a parameter characteristic of the thermal load of the engine exceeds, or has a tendency to exceed, a predetermined threshold T_{MAX}, and in the direction for reducing the fuel flow down to a minimum value, if said characteristic parameter drops, or has a tendency to drop, below said threshold T_{MAX}.

4,616,482

TURBOCHARGING DEVICE FOR AN INTERNAL COMBUSTION ENGINE

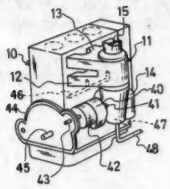
Sven-Olof Kronogard, Lomma; Clas-Olof Kronogard, Gråbo, and Hakan Kronogard, Lund, all of Sweden, assignors to AB Volvo, Sweden

Division of Ser. No. 292,947, Aug. 14, 1981, Pat. No. 4,474,007.
This application Aug. 1, 1984, Ser. No. 636,593
Claims priority, application Sweden, Sep. 29, 1980, 80068042
Int. Cl.[4] F02B 37/00
U.S. Cl. 60—624 3 Claims

1. A turbocharging device for an internal combustion engine comprising:

(A) a first turbine supplied with exhaust gas from said engine and having an output shaft driving a compressor feeding combustion air to said engine, said first turbine and said compressor being mounted with their shafts vertically and perpendicularly disposed to the crank shaft of said engine;

(B) a second turbine mounted with its shaft parallel to said crank shaft and supplied with gas exhausted from said first turbine and having an output shaft drivingly connected to said engine, and



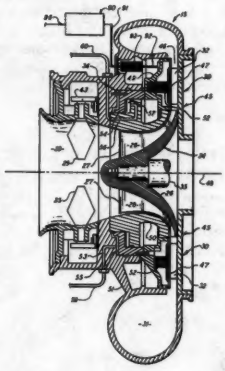
(C) means to supply additional fuel to the passage between said first and second turbine.

4,616,483

DIFFUSER WALL CONTROL

Gary S. Leonard, Minoa, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 29, 1985, Ser. No. 730,411
Int. Cl.[4] F25B 1/04, 49/00; F04B 29/46
U.S. Cl. 62—115 5 Claims



1. A method of controlling a motor driven centrifugal compressor used in a refrigeration system that includes

movably mounting at least one wall in a compressor diffuser so that the size of the diffuser opening may be varied,

developing a theoretical condenser water schedule curve for optimum operation of the compressor,

relating the water schedule curve to the motor current and the wall position so that desired wall positions can be determined from motor current values,

measuring the motor current and determining a desired wall position,

sensing the actual position of the movable wall,

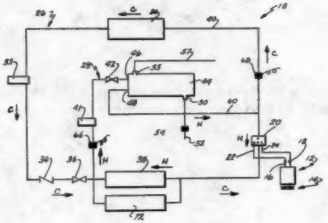
comparing the actual position of said wall to the desired position of said wall,

moving said wall to the desired position in the event the actual position is different than the desired position.

4,616,484
VEHICLE REFRIGERANT HEATING AND COOLING SYSTEM

Syed A. Mehdi; William E. Zieske, both of Rockford, and David R. Ward, Byron, all of Ill., assignors to Kysor Industrial Corporation, Cadillac, Mich.

Filed Nov. 30, 1984, Ser. No. 676,679
Int. Cl.[4] F25D *17/00*; B60H *1/32*
U.S. Cl. 62—180 16 Claims

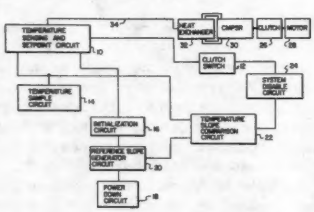


1. A heat pump for heating a vehicle interior, said heat pump comprising:
- a refrigerant compressor;
- an inside coil connected to said compressor;
- an expansion valve connected to said coil;
- a heat exchanger connected to said expansion valve, said heat exchanger including an engine fluid heat source inlet and an engine fluid heat source outlet;
- valve means connected to said fluid heat source inlet for controlling the flow of fluid to said heat exchanger and hence the output capacity of said inside coil; and
- control means operatively connected to said valve means for controlling said valve means as a function of coolant temperature, vehicle interior temperature and a desired temperature so that said control means closes said valve means to reduce the flow of fluid at said engine fluid heat source inlet when said vehicle interior temperature exceeds said desired temperature.

4,616,485
TEMPERATURE CONTROLLER FOR AN AIR CONDITIONING APPARATUS

Jimmie D. Gillett, Garland; Ronald E. Ellis, Flower Mound, and Michael D. Robertson, Coppell, all of Tex., assignors to Ranco Electronics Division, Irving, Tex.

Filed Feb. 14, 1985, Ser. No. 701,403
Int. Cl.[4] F25B *1/00*
U.S. Cl. 62—228.1 15 Claims

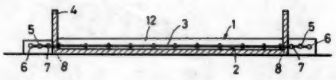


1. A temperature controller for an air conditioning device comprising:
- a temperature sensing means for providing an output temperature signal from the air conditioning device;
- a temperature rate of change comparison means for providing an indication signifying the rate of temperature change from the temperature sensing means exceeds a predetermined limit in comparison with a reference rate of temperature change; and
- disabling means for disabling the air conditioning device upon receiving the indication from the temperature rate of change comparison means.

4,616,486
APPARATUS FOR RETAINING COOLING PIPES FOR AN ICE RINK

Kazuo Ohashi, 46-6, 4-chome, Nukui, Nerima-ku, Tokyo, Japan

Filed Jun. 20, 1985, Ser. No. 747,109
Claims priority, application Japan, Aug. 10, 1984, 59-121981[U]
Int. Cl.[4] A63C *19/10*
U.S. Cl. 62—235 6 Claims

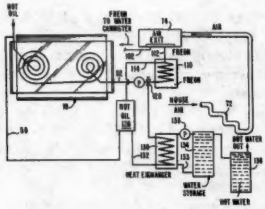


1. An apparatus for retaining cooling pipes employed in an ice rink, comprising:
- at least one belt-shaped base member which is disposed on the floor portion of a rink; and
- a supporting member integrally formed with said base member to project vertically therefrom above the height of upper ends of said cooling pipes, said supporting member including fitting notch portions for retaining said cooling pipes at positions over and above the floor portion of the rink and at predetermined spacings over the length of said supporting member, and further including cut portions at respective upper ends of said fitting notch portions, wherein said retaining apparatus is made of flexible synthetic resin and retains said cooling pipes at predetermined positions in said ice rink so that ice forms directly about and beneath the cooling pipes when a liquid is provided on the floor portion and coolant is circulated in the pipes, said liquid being prevented by said supporting member from movement across the floor portion in the direction of the pipes.

4,616,487
LOW ENERGY CONSUMPTION AIR CONDITIONING SYSTEM

William N. Franklin, 6003 Greentree Rd., Bethesda, Md. 20817

Filed Aug. 23, 1985, Ser. No. 768,760
Int. Cl.[4] F25B *27/00*
U.S. Cl. 62—235.1 12 Claims



1. A system which utilizes solar energy for conditioning air in a building comprising, in combination:
- (A) solar energy collection means which comprises:
  - (1) an enclosure having a bottom and side and end walls,
  - (2) a continuous hollow heat exchange coil having an inlet end and an outlet end,
  - (3) heat exchange oil circulating through said coil, and

(4) adjustable reflectors for reflecting and concentrating solar energy into said enclosure;

(B) first means for exchanging heat with said air comprising:

(1) a water evaporator having a water inlet, means for circulating water through said evaporator, a water outlet, means for effecting heat exchange between air flowing therethrough and said water, an air inlet end, and an air outlet end,

(2) closed circuit recirculating means for supplying water to said water inlet and receiving water from said water outlet;

(C) second means for exchanging heat with said air comprising subterranean conduit means having an inlet end connected to said air outlet end of said water evaporator, and an outlet end, and disposed at a sufficient depth such that the ambient temperature is substantially constant, whereby air flowing through said conduit exchanges heat with the surrounding ground;

(D) third means for exchanging heat with said air comprising a refrigerant evaporator having a refrigerant inlet, a refrigerant outlet, a heat exchange coil between said refrigerant inlet and outlet, an air inlet connected to said outlet end of said conduit means, and an air outlet end from which conditioned air exits to said building;

(E) secondary heat exchange means comprising:

(1) first secondary means for exchanging heat between said water and said refrigerant having a refrigerant inlet connected to said refrigerant outlet of said refrigerant evaporator, and a refrigerant outlet, and disposed in said closed circuit water recirculating means,

(2) second secondary means for exchanging heat between said refrigerant and said oil having a refrigerant inlet end connected to said refrigerant outlet of said first secondary heat exchange means, a refrigerant outlet end connected to said refrigerant inlet of said refrigerant evaporator, an oil inlet end connected to said outlet end of said solar collection means coil, and an oil outlet end connected to said inlet end of said solar collection means coil; and

(F) blower means for forcing air seriatim through said first heat exchange means, said second heat exchange means, and said third heat exchange means.

4,616,488

SINGLE OR MULTI-CAM SYSTEM FOR FLAT-BED KNITTING MACHINES

Hermann Schmodde, Albstadt, Fed. Rep. of Germany, assignor to H. Stoll GmbH & Company, Fed. Rep. of Germany

Continuation of Ser. No. 644,900, Aug. 28, 1984. This application Oct. 7, 1985, Ser. No. 784,974

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1983, 3334040

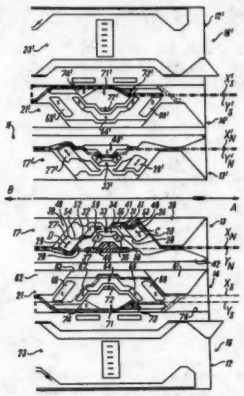
Int. Cl.[4] D04B *7/10*

U.S. Cl. 66—70 **7 Claims**

1. A single or multi-cam system for flat-bed knitting machines having at least a needle cam unit and a selector cam unit arranged one beneath the other, the needle cam unit including at least one integrated knitting/transfer cam assembly for both carriage traverse and transfer directions, wherein:

(i) the knitting cam portion of said integrated knitting/transfer cam assembly includes spaced apart stitch cams, each having a leading lobe and a trailing lobe, said leading lobe being higher than said trailing lobe for pretensioning the loops/stitches and said trailing lobe serving to transfer the loops/stitches; and

(ii) the transfer cam portion of said integrated knitting/transfer cam assembly includes a transfer receiving cam part



associated with the stitch cams and at least one of said stitch cams.

4,616,489

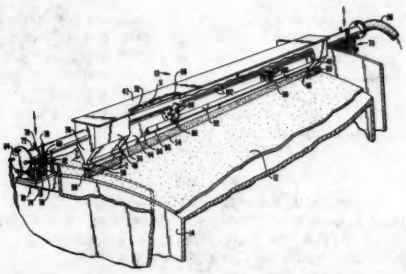
STOCK WASHER

Robert F. Wood, Portland, Oreg., and William R. Vanderveer, Vancouver, Wash., assignors to Fabcon, Inc., San Francisco, Calif.

Filed Oct. 29, 1984, Ser. No. 665,677

Int. Cl.[4] D21C *9/02*

U.S. Cl. 68—200 **11 Claims**



1. An improved washer for removing chemicals from a mat of porous material impregnated by the chemicals, the washer comprising an elongate housing defining a non-pressurized chamber therein, the housing being positioned above the mat, the housing being polygonal in section with a bottom portion narrower than a top portion, and the housing having a longitudinal slot proximate the mat, and dispersion means within the chamber for controlling the flow of cleaning liquid as it moves through the chamber and into the slot, wherein the improvement comprises:

a pressurized dispersion pipe extending through the elongate chamber above the longitudinal slot;

inlet means attached to the pipe for introducing cleaning liquid into the pipe; and

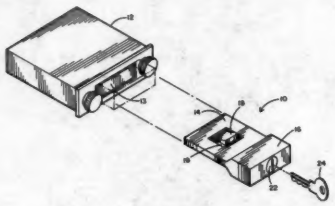
the pipe defining a plurality of spaced apart holes positioned along the length of the pipe within the housing to permit the cleaning liquid to flow out of the holes and into the chamber.

4,616,490

LOCKING APPARATUS FOR DISCOURAGING THEFT OF TAPE CASSETTE PLAYERS

Leslie D. Robbins, 6325 Arbutus St., Huntington Park, Calif. 90255

Filed Jan. 31, 1985, Ser. No. 696,961
Int. Cl.[4] E05B *73/00*
U.S. Cl. 70—14 **2 Claims**



1. A locking device adapted for insertion into the cassette compartment of a tape cassette player, the device comprising:

an external portion having a locking mechanism accessible when said locking device is inserted into said compartment,

an internal portion of dimensions substantially equivalent to a tape cassette for insertion into said compartment,

said internal portion having at least one latch selectively extendable through a window in a surface of said internal portion, said latch being adapted for engaging structure of said player within said compartment adjacent said internal portion, and

a latch actuator communicating with said locking mechanism and with said latch, said actuator being responsive to said locking mechanism for extending said latch through said window when said locking mechanism is locked and retracting said latch when said locking mechanism is unlocked,

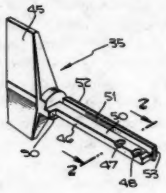
said latch actuator comprising an elongated rod having a first side and a second side, the first side being greater in width than the second side, said rod being connected to said locking mechanism for rotation upon activation of said locking mechanism whereby either said rod first side or said rod second side is directed toward said latch for selective engagement therewith.

4,616,491

KEY OPERATED ELECTRONIC LOCK

Leonard J. Genest, 1061 Tropic La., Santa Ana, Calif. 92705

Filed May 30, 1984, Ser. No. 615,221
Int. Cl.[4] E05B *47/00*
U.S. Cl. 70—276 **49 Claims**



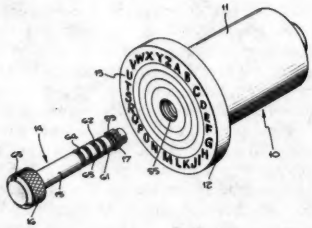
1. A key operated electronically programmed release mechanism for enabling manipulation of a latch bolt comprising a frame having therein an extendable and retractable latch bolt, a blocker having a first position blocking movement of the latch bolt and a second position removed from said first position, a motor in operable engagement with the blocker for moving the blocker between said positions, an electrically programmed actuating circuit for said motor, a lock mechanism comprising a lock body having a key responsive element mounted therein, said key responsive element having a keyway and a key for said keyway, operating means interconnecting said latch bolt and said key responsive element for shifting said latch bolt between locked and unlocked positions, an activating means for said actuating circuit, magnetic coding on said key and a read head in the actuating circuit and subject to said magnetic coding when the key is in the keyway whereby said coding is adapted to implement activation of said actuating circuit to a condition wherein said blocker is shifted by motor action to enable manipulation of said latch bolt by key movement.

4,616,492

KEY COMBINATION LOCK

J. David Barfield, 3361 Bagley Ave. #1, Los Angeles, Calif. 90034

Filed Sep. 7, 1984, Ser. No. 648,756
Int. Cl.[4] E05B *37/02*
U.S. Cl. 70—284 **20 Claims**



1. A combination type locking device for operation with a key member, said device comprising a substantially cylindrical housing having a key access outer end and a lock operating inner end, a lock operating plug rotatably mounted in said housing at the inner end, a plurality of pairs of discs rotatably mounted in said housing intermediate the outer and inner ends, one disc of each pair being a combination disc and the other disc of each pair being a locking disc, said locking disc having a circumferentially disposed release slot and said combination disc having a plurality of circumferentially spaced combination slots, a longitudinally extending slide bar having a first position in rotation blocking engagement with said plug and a second position free of engagement with said plug, longitudinally spaced blockers on said slide bar having positions respectively in said combination slots when said slide bar is in said first position and having positions in said release slots when said slide bar is in said second position, said slide bar being shiftable from said first position to said second position when the release slot of each pair of discs has been rotated to decoding alignment with the respective blocker whereby to release said plug for lock operation.

4,616,493

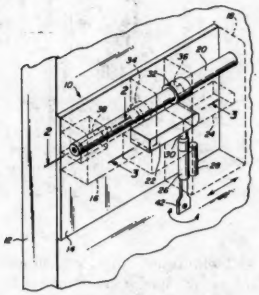
SHROUDED TRACK SLIDE BOLT

Anthony Fazzolari, and Nicholas Fazzolari, both of 2205 Utica Ave., Brooklyn, N.Y. 11234

Filed Feb. 22, 1984, Ser. No. 582,374
Int. Cl.[4] E05B *65/06*
U.S. Cl. 70—129 **7 Claims**

1. A shrouded track slide bolt comprising in combination a slide bolt, a housing for said slide bolt, said housing being split to include a fixed block and a laterally positioned sliding block, a rear portion of said slide bolt being permanently imbedded into said slide block, said fixed block acting as a bushing for slidably receiving a forward portion of said slide bolt, a steel

support plate for affixing onto a door and fixedly supporting said fixed block and slidably supporting said sliding block, said sliding block being slidable between a retracted position laterally spaced from said fixed block wherein the slide bolt is retained within the fixed block and an extended position abutting the fixed block wherein the slide bolt projects from the fixed block, whereby in the vicinity of the door said slide bolt is completely shrouded within the housing in the extended position without any sliding handle attached to the slide bolt, a block guide securely fixed onto said support plate and received in the extended position within an accommodating mating



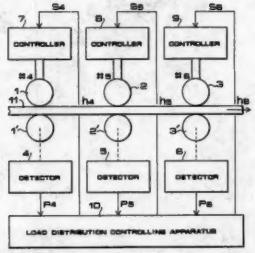
channel in the sliding block, a pair of spaced apart lock receiving means in said block guide, lock means retained in said sliding block for selective insertion in one of said lock receiving means to selectively lock the slide bolt in a corresponding one of its extended and retracted positions, a rotatable collar around the portion of the slide bolt spanning said fixed and sliding blocks in the extended position, and corresponding annular detents formed in said fixed and sliding blocks for accommodating said rotatable collar, said rotatable collar preventing breach of said slide bolt by cutting through said slide bolt at the abutting faces of said fixed and sliding blocks.

4,616,494

METHOD OF AND APPARATUS FOR CONTROLLING LOAD DISTRIBUTION FOR A CONTINUOUS ROLLING MILL

Yoshikazu Kotera, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 12, 1984, Ser. No. 660,273
Claims priority, application Japan, Oct. 15, 1983, 58-192738
Int. Cl.[4] B21B *37/08*
U.S. Cl. 72—8 **1 Claim**



1. A load distribution controlling method for a continuous rolling mill for rolling plate material, comprising the steps of:

judging whether the rolling load amounts at two downstream stands, including the most downstream stand, coincide with preset values for a preset load distribution ratio;

calculating, if coincidence is not found, changing amounts to plate thickness rolling reduction rates at said two downstream stands;

correcting the rolling reduction position at said two downstream stands in accordance with the thus calculated changing amounts to effect load distribution control;

judging, when the rolling load amounts at said two downstream side stands are made to coincide with the values for the preset load distribution ratio by the load distribution control, whether rolling load amounts at the three downstream stands coincide with values for a preset load distribution ratio;

calculating, if coincidence is not found, changing amounts to the plate thickness rolling reduction rates at said three downstream stands;

correcting the rolling reduction positions at said three downstream stands in accordance with the changing amounts thus calculated to effect load distribution control;

repeating, in a similar manner, such correction of the load distribution ratio depending upon a determination whether a desired load distribution ratio is established among a plurality of stands, always including the last stand; and

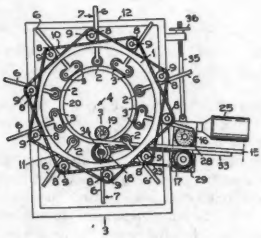
repeating such correction of the load distribution ratio successively to stands further upstream in said rolling mill.

4,616,495

HELICALLY-FORMED PIPE WINDING MACHINE

Stanley W. O. Menzel, Hartsville, S.C., assignor to Rib Loc Hong Kong Limited, Hong Kong

PCT No. PCT/AU83/00065, § 371 Date Jan. 10, 1984, § 102(e) Date Jan. 10, 1984, PCT Pub. No. WO83/04196, PCT Pub. Date Dec. 8, 1983
Continuation of Ser. No. 572,534, Jan. 10, 1984, abandoned. This PCT application May 20, 1983, Ser. No. 807,772
Claims priority, application Australia, May 27, 1982, PF4172
Int. Cl.[4] B21C *37/12*
U.S. Cl. 72—49 **13 Claims**



1. A machine for forming helically wound pipe from a plastic ribbed preformed strip comprising a frame, a series of rollers axially extending and rotatably mounted on spaced apart end rings, said rings being mounted in said frame for rotation in opposite directions, said rollers being positioned to form an annulus of rollers arranged to curve the strip to a helical form within the annulus with the edges of the strip overlapping, joining means carried by said rings to press the overlapping edges together to form a pipe, said joining means comprising a joining roller on a shaft supported by said rings and a pressure member positioned at the meeting of the first convolution with the strip to press the end of the convolution into locking engagement with the said strip, a strip guide engaging at one end the said shaft of the joining roller and projecting tangentially to the annulus, a pair of feed rollers remote from the said joining roller mounted on an opposite end of said strip guide to control the rate of feed of the strip to the joining rollers, and driving means for the joining roller and for at least one of the

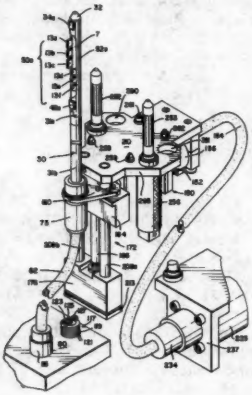
feed rollers to cause the said joining roller to have a greater peripheral speed than the said feed rollers whereby to maintain the strip between the joining roller and the said feed rollers in tension, whereby when rotating said one ring opposite to the other the angle of the said annulus of rollers and the said strip guide are variable in relation to the axis of the pipe being formed to compensate for diameter and strip width.

4,616,496

ROTOPEENING APPARATUS HAVING A FLEXIBLE SPINDLE

Phillip J. Hawkins, Penn Hills Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 7, 1985, Ser. No. 731,241
Int. Cl.[4] B24C *3/16*; C21D *7/06*
U.S. Cl. 72—53 **31 Claims**



1. An apparatus for rotopeening the inside wall of a conduit, comprising:

(a) at least one peening spindle having a flexible, rotatable and reciprocable housing, wherein said housing includes a lateral opening, but has an otherwise substantially continuous outer surface;

(b) a flexible mandrel contained within the housing having at least one peening means operatively connected thereto, and

(c) bearing means located within and supported by the housing for rotatably mounting the mandrel within the housing off-center relative to the longitudinal axis of the housing and with said peening means in alignment with said lateral opening of said housing so that said peening means rotates, orbits and reciprocates within the conduit when said mandrel and housing are rotated and reciprocated.

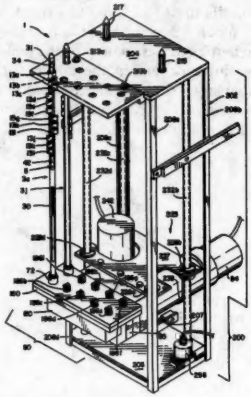
4,616,497

ROTOPEENING METHOD

Douglas G. Harman, Pensacola Beach, Fla.; Luciano Veronesi, O'Hara Township, Allegheny County, and Andrew Wowczuk, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 7, 1985, Ser. No. 731,256
Int. Cl.[4] C21D *7/06*
U.S. Cl. 72—53 **27 Claims**

1. A method of uniformly peening the inside wall of a conduit to a desired final peening intensity by means of at least one rotatable peening flapper, comprising the step of simultaneously rotating and orbiting the flapper within the conduit with the axis of rotation substantially parallel to but radially displaced from the longitudinal axis of the conduit by a constant distance, wherein the angular speed of the flapper and the constant distance of radial displacement are selected so that the slope of the function defined by the peening intensity of the



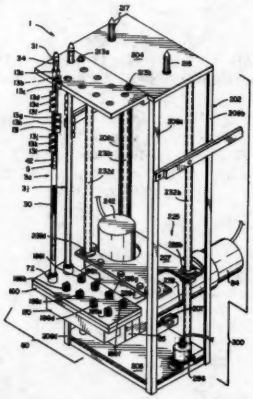
inside conduit wall with respect to time is substantially flat in the vicinity of the desired final peening intensity.

4,616,498

MULTI-SPINDLE ROTOPEENING APPARATUS

Bruce W. Bevilacqua, Penn Township, Westmoreland County; Ralph W. Klug, Oakmont; David C. Carlsen, Baldwin Boro, and Dennis J. Dinucci, Hopewell, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 7, 1985, Ser. No. 731,260
Int. Cl.[4] B24C *3/16*; C21D *7/06*
U.S. Cl. 72—53 **38 Claims**



1. An apparatus for rotopeening the inside wall of a conduit, comprising:

(a) at least one peening spindle which is insertable within the conduit and which includes a rotatable housing which substantially encloses a rotatable mandrel having a peening means, wherein said mandrel is journalled within the housing in an off-center relationship;

(b) a rotary and orbital drive assembly having a co-axial drive shaft which is coupled to the housing and the man-

drel of the peening spindle for simultaneously rotating and orbiting said peening means within said conduit, and

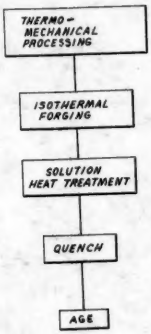
(c) an oscillatory drive assembly coupled to the rotary and orbital drive assembly for reciprocating said peening means within said conduit while said peening means rotates and orbits.

4,616,499

ISOTHERMAL FORGING METHOD

Robert M. Gray, Atlanta, Ga., assignor to Lockheed Corporation, Calabasas, Calif.

Filed Oct. 17, 1985, Ser. No. 788,359
Int. Cl.[4] B21D *22/00*
U.S. Cl. 72—56 **9 Claims**



1. A method of fabricating articles from precipitation hardening aluminum alloys which comprise the steps of:

(a) thermomechanically processing the alloy to achieve a microstructure in which the grain size of the alloy does not exceed an average of 20 microns taken along the longest dimension of the grain;

(b) forging the alloy to a desired configuration in hot dies at a constant forging temperature at which deformation of the alloy occurs at a minimum strain rate and which is above the temperature at which substantial precipitation of the alloy constituents will occur;

(c) heat treating the forged article to obtain desired mechanical properties; and

(d) reducing the temperature of the article to a temperature below the crystallization temperature of the alloy constituents at a rate at which crystallization of said alloy constituents cannot occur.

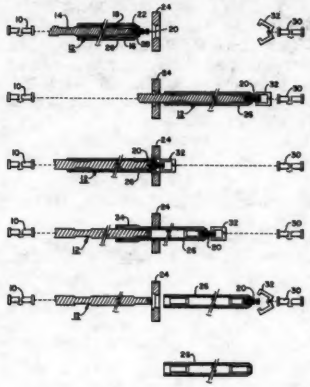
4,616,500

METHOD FOR PRODUCING TUBING OF VARYING WALL THICKNESS

Randall L. Alexoff, Youngstown, Ohio, assignor to George A. Mitchell Company, Youngstown, Ohio

Filed Feb. 25, 1985, Ser. No. 704,755
Int. Cl.[4] B21C *1/24*
U.S. Cl. 72—283 **13 Claims**

9. A method for producing tubing having a variable wall thickness along its length which comprises nosing-down one end of a tube of constant wall thickness to produce an opening in said one end which is of smaller cross section than the remainder of the tube, threading the tube over a mandrel having a removable plug at one end thereof until a portion of said plug extends through the opening in said nosed-down end, pushing the tube and the mandrel through a die to cause the tube to extrude while reducing its outer periphery and while causing the inner periphery of the tube to conform to the periphery of the mandrel due to the plasticity of the material from which the tube is formed, and pulling said removable plug and said



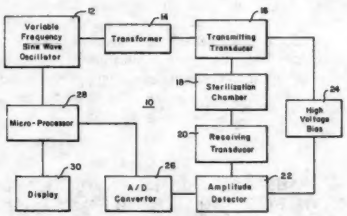
tube from the remainder of the mandrel while causing the outer periphery of the tube to pass through a die.

4,616,501

SYSTEM FOR DETERMINING GAS CONCENTRATION

Douglas M. Mechlenburg, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.

Filed Apr. 23, 1985, Ser. No. 726,136
Int. Cl.[4] G01N *29/02*
U.S. Cl. 73—24 **3 Claims**



1. A system that provides an indication of the concentration of at least one gas present within a chamber comprising:

means for causing mechanical radiant energy to propagate through the chamber at at least two operating frequencies which provide unique information over at least a portion of various gas concentrations;

means for measuring the amplitude of said propagating mechanical radiant energy at each operating frequency at a predetermined point within the chamber; and

means for fitting said measured amplitudes to a modeled amplitude response representative of a plurality of concentrations of the at least one gas to determine the concentration of the at least one gas present in the chamber.

4,616,502
KNOCKING DETECTION SYSTEM FOR INTERNAL COMBUSTION ENGINE

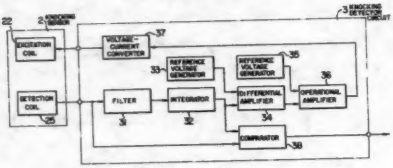
Yoshinori Ootsuka; Tadashi Hattori, both of Okazaki; Tadashi Ozaki, Gamagori, and Kazuhiko Miura, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Sep. 20, 1983, Ser. No. 533,972

Claims priority, application Japan, Sep. 21, 1982, 57-165770; Sep. 21, 1982, 57-165771

Int. Cl.⁴ G01L *23/22*

U.S. Cl. 73—35 **2 Claims**



1. A knocking detection system for an internal combustion engine, comprising:

vibration detector means for producing in response to engine vibrations a controllable electrical output signal representing a knocking component of said engine vibrations in the presence of knocking and a noise component of said engine vibrations in the absence of a knocking wherein said vibration detector means includes a magnetic path with a magnetic gap changing in accordance with vibrations of said engine, excitation coil means for driving magnetic flux of said magnetic path, and detection coil means for detecting change of magnetic flux caused with change of said magnetic gap;

means for deriving the noise-component from said controllable electrical output signal;

means for producing a knocking detection signal in response to said knocking component of said electrical output signal; and

feedback control means responsive to the derived noise component for controlling said vibration detector means to maintain the level of the derived consequent noise component substantially constant regardless of engine operating conditions, thereby enhancing the knocking-/noise component ratio of said output signal during engine operating conditions which would otherwise increase said noise component wherein said feedback control means includes an integrator circuit for integrating an output of said detection coil means, and a variable current source for changing excitation current supplied to said excitation coil means to maintain the integrated output of said integrator circuit substantially constant.

4,616,503
TIMER TRIGGER FOR CAPILLARY TUBE VISCOMETER AND METHOD OF MEASURING OIL PROPERTIES

Donald W. Plungis, No. Brunswick; Charles S. Seymour, Neptune, and William Higgins, Old Budge, all of N.J., assignors to Analysts, Inc., Rolling Hills Estates, Calif.

Filed Mar. 22, 1985, Ser. No. 714,727

Int. Cl.⁴ G01N *11/04*

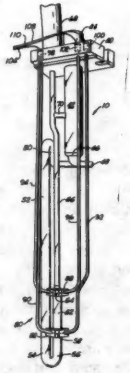
U.S. Cl. 73—55 **5 Claims**

1. A capillary tube viscometer for use in determining viscosity of oil of any clarity flowing between two predetermined points in said viscometer wherein said tube includes a labyrinth of bent glass tube portions including an enlarged upper tube reservoir having an open top a restricted bottom portion moving into a reduced diameter portion a middle tube section, a lower bend portion moving into an upwardly extending tube portion having an upper end and an enlarged testing bulb portion between said lower bend portion and said tube portion, all of said portions and sections having communicating bores forming a continuous flow bore therein, said capillary tube viscometer including:

a mounting block adjacent the open top of said reservoir for receiving and holding said reservoir and for receiving and holding the upper end of said upwardly extending tube section;

said enlarged bulb portion having a bottom start point wherein said bulb portion and said bore of said upwardly extending tube portion communicate and the peripheral wall around said bore is thicker than the diameter of said bore and having an upper stop point wherein said bulb portion and said bore of said upwardly extending end section communicate and the peripheral wall around said bore is thicker than the diameter of said bore;

start light metering means positioned on said tube adjacent said start point adapted to meter said point at one value and yet change the value when said point is interrupted by the flow of oil of any clarity and a light input fiber optic rod extending between said mounting block and said start point receiving light from said light means, a light detector fiber optic rod extending from said block to said start



point, and said input fiber optic rod and said light detecting fiber optic rod at said start point are mounted 90° apart;

stop light metering means positioned on said tube adjacent said stop point adapted to meter said point at one value and yet change the value when said point is interrupted by the flow of oil of any clarity and a light input fiber optic rod extending from said block to said stop point receiving light from said light means, a light detector fiber optic rod extending from said block to said stop point, and said light input fiber optic rod and said light detecting fiber optic rod at said start point are mounted 90° apart;

light means in said mounting block connected to said start and stop fiber optic rods;

sensing circuitry mounted in said mounting block associated with said start and stop light metering means adapted to receive the value changes and communicate said changes; and

leads from said sensing circuitry adapted to pass the values to appropriate apparatus for calibrating the elapsed time oil moves from the start to stop point to determine viscosity of said oil.

4,616,504

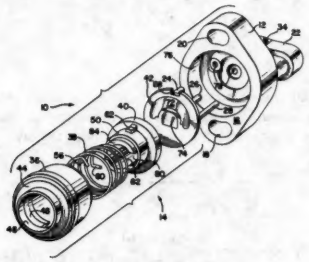
THROTTLE POSITION SENSOR

Donald A. Overcash, San Juan Capistrano; Lloyd E. Hall, Fullerton, and Guenter W. Mueller, Santa Ana, all of Calif., assignors to Duncan Electronics, Costa Mesa, Calif.

Continuation-in-part of Ser. No. 491,220, May 3, 1983, abandoned. This application Mar. 29, 1984, Ser. No. 594,758

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—118.1 29 Claims



20. A throttle position sensor comprising:

a one piece casing having first and second ends, said casing having a first bearing surface formed as part of said casing and a second bearing surface aligned with said first bearing surface formed as part of said casing, said first and second bearing surfaces being spaced from one another;

a rotor having a first bearing surface designed to mate with said first bearing surface of said casing and a second bearing surface designed to mate with said second bearing surface of said casing, said rotor being mounted for rotational movement in said casing on said bearing surfaces; and

said throttle position sensor configured so as to be connectable to a throttle assembly.

4,616,505

FLUID FLOW MEASURING DEVICE

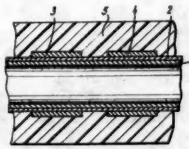
Wijbren Jouwsma, Lochem, Netherlands, assignor to Bronkhorst High-Tech B.V., Netherlands

Filed May 18, 1984, Ser. No. 611,598

Claims priority, application Netherlands, May 18, 1983, 8301765

Int. Cl.[4] G01F *1/68*

U.S. Cl. 73—204 29 Claims



1. A fluid flow measuring device comprising:

(a) an elongated channel to contain the fluid flow being measured, said channel comprising a thin wall permitting good thermal conductance thereacross;

(b) a plurality of temperature sensitive electrical resistance elements integral with an electrically insulative substrate having a high thermal conductivity, said substrate being positioned at the outside surface of said channel wall, a first said resistance element being positioned upstream from a second said resistance element;

(c) means to heat at least one said resistance element, a temperature differential representative of said fluid flow thereby being created between said first resistance element and said second resistance element; and

(d) means to generate an electrical signal representative of said temperature differential.

4,616,506

APPARATUS FOR MEASURING THE MASS OF A FLOWING MEDIUM AND METHOD FOR PRODUCING AN APPARATUS FOR MEASURING THE MASS OF A FLOWING MEDIUM

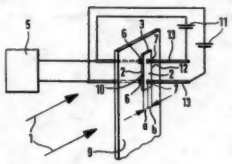
Jaihind S. Sumal, Vaihingen/Ensingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 486,764, Apr. 20, 1983, abandoned. This application Apr. 18, 1985, Ser. No. 795,731

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1982, 3229844

Int. Cl.[4] G01F *1/68*

U.S. Cl. 73—204 6 Claims



1. An apparatus for measuring the mass of a flowing medium comprising at least one temperature-dependent resistor in a flow of said medium and disposed on a carrier in the form of a resistance coating, said carrier supportable in said flow by means of rigid electrical connections to said resistance coating, further wherein said electrical connections protrude entirely through a fastening opening in said carrier and said resistance coating and are soldered to said resistance coating.

4,616,507

DEVICE FOR ASSEMBLING/DISASSEMBLING A READER HEAD ON OR FROM ITS GUIDED SCALE WHILE THIS REMAINS SECURED TO A MACHINE TOOL BED PLATE

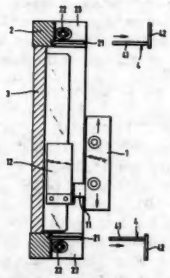
Manuel B. Rementería, Guipúzcoa, Spain, assignor to Aurki, S. Coop. Ltda., Spain

Filed Dec. 21, 1984, Ser. No. 684,692

Claims priority, application Spain, May 31, 1984, 279621

Int. Cl.[4] G01D *11/24*

U.S. Cl. 73—431 3 Claims



1. An improved device for assembling/disassembling a reader head on or from its guided scale while said guided scale

remains secured to a machine tool bed plate, said guided scale having a main body and two side blocks, each of said side blocks having a means to attach to said main body and a means to attach to said machine tool bed plate wherein the improvement comprises each of said side blocks having a generously sized hollow opening, said hollow located at the sides of said side blocks and at the side facing the reader head, each said hollow having a guide around the perimeter of said hollow, and a side cover for each of said side blocks, said side cover having means for engaging said guide around the perimeter such that in order to assemble/disassemble the reader head without disturbing the alignment of the scale one of the side covers is removed.

4,616,508

METHOD AND APPARATUS FOR PRODUCING A TEST PIECE OF MOLDING COMPOUND USEFUL IN MEASURING PROPERTIES THEREOF

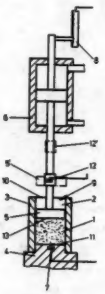
Alfred Jörn, Bibern, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Feb. 13, 1984, Ser. No. 579,661

Claims priority, application Switzerland, Feb. 28, 1983, 1093/83

Int. Cl.[4] G01N *3/08*

U.S. Cl. 73—823 **11 Claims**



10. Apparatus for producing a test piece of molding compound useful for measurement of the properties of said compound by compressing said compound to a specified pressure at a particular volume comprising means defining a cavity having a certain geometry within which a specific measured volume of said molding compound may be provided, compaction means for applying a compaction pressure to said compound from one side of said cavity, sensing means for measuring the pressure on said compound on a side of said cavity opposite said one side, means for measuring the distance moved by said compaction means, said sensing means being located to measure the pressure applied by said compaction means directly at the surface of said molding compound on a side of said cavity opposite said one side.

4,616,509

FLOW DETECTORS

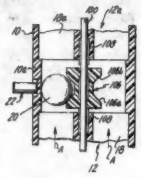
Murray F. Feller, Box 1247, Dunnellon, Fla. 32630

Filed Jan. 15, 1985, Ser. No. 691,698

Int. Cl.[4] G01F *1/32*

U.S. Cl. 73—861.05 **11 Claims**

1. Apparatus for sensing the flow of fluid, including an orbital ball, a tubular wall defining an axial fluid flow passage and providing an outer circular ball-guiding track on the inside of the wall, means providing an inner circular ball-guiding track, both of said tracks being centered at the axis of the tubular wall and defining an orbital path for the ball, vane means in said passage for forming a swirling ball-orbiting fluid-flow pattern crossing said orbital path, and means for detecting the orbiting of the ball, said detecting means including piston-mode piezoelectric transducer means fixed to said



tubular wall and disposed on the exterior thereof substantially opposite said outer circular track, and excitation and receiver circuit means connected to said transducer means.

4,616,510

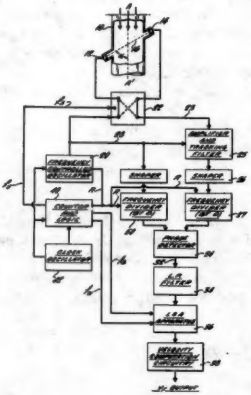
FLUID VELOCITY MEASURING METHOD AND APPARATUS

James O. Moore, Worcester, Pa., assignor to Moore Products Company, Spring House, Pa.

Filed Apr. 15, 1985, Ser. No. 723,501

Int. Cl.[4] G01F *1/66*

U.S. Cl. 73—861.27 **10 Claims**



1. The method of measuring the velocity of a fluid along a predetermined direction, comprising:

transmitting acoustic waves through said fluid from a transmitting acoustic transducer to a receiving acoustic transducer;

varying the frequency of said acoustic waves between different values;

measuring the phase delays of said acoustic signals of different frequencies in travelling through said fluid from said transmitter acoustic transducer to said receiver acoustic transducer, to produce first signals representative of said phase delays;

producing second signals representative of said different values of frequency of said acoustic waves; and

deriving, from said first and second signals, third signals representative of the rate of change of said delays with frequency; and

from said third signals, deriving fourth signals representative of said fluid velocity.

4,616,511

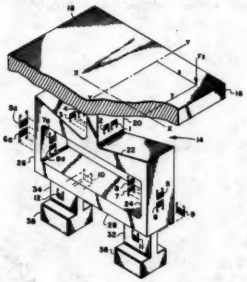
TACTILE SENSOR

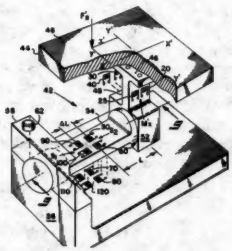
Sherif S. Gindy, and Ronald R. Tremonti, both of Troy, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 20, 1985, Ser. No. 703,353

Int. Cl.[4] G01L *5/16;* **G01G** *3/14;* **B25J** *15/02, 19/00*

U.S. Cl. 73—862.04 **3 Claims**





1. A tactile transducer for determining location and magnitude of an applied load upon a load plate comprising:

(a) an elongated vertically extending pedestal portion having the transverse section thereof having a greater width in one of two orthogonal directions, said pedestal portion movement deflection sensitive about an "Y" axis in the direction of said greater transverse width;

(b) a yoke bar portion having the base end of said pedestal portion attached intermediate the ends thereof;

(c) a plurality of spaced vertical load sensing leg portions disposed one at each opposite end of said yoke bar portion and joined integrally thereto in rigid moment deflection resisting attachment,

(d) a rigid transverse member interconnecting the opposite ends of said vertical load sensing leg members;

(e) at least one support member having one end thereof joined to said transverse member on and extending therefrom in a direction opposite said vertical load sensing leg poritons, said support member operatively moment sensitive about an "X" axis orthogonal to said "Y" axis;

(f) an attachment base portion on the end of said support member remote from said transverse member;

(g) said load plate rigidly secured to said pedestal in moment deflection resisting connection for transmitting therethrough moments applied to said plate; and,

(h) electrical strain gage means disposed on said pedestal portion, said vertical load sensing leg portions and said support member, said strain gage means on all of said vertical load sensing leg portions having the signals therefrom summed to provide an indication of the total load F_z applied to said load plate, said strain gage means on said pedestal portion providing a signal indicative of the distance y in a direction normal to said "X" axis along said load plate from the center of said pedestal portion of application of F_z in accordance with the expression $y=F_z/M_x$ wherein M_x is the bending moment of F_z about the "X" axis, said strain gage means on said support member providing a signal indicative of the distance x in a direction normal to said "Y" axis along said load plate from the center of said pedestal of application of F_z in accordance with the expression $x=F_z/M_y$, where M_y is the bending moment of F_z about the "X" axis.

4,616,512

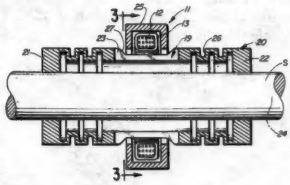
TORQUEMETER

Sydney Himmelstein, Barrington Hills; Richard S. Tveter, Barrington, and James P. Beck, Elgin, all of Ill., assignors to S. Himmelstein and Company, Hoffman Estates, Ill.

Filed Nov. 23, 1984, Ser. No. 674,165

Int. Cl.[4] G01L *3/10*

U.S. Cl. 73—862.36 **32 Claims**



1. In a noncontact shaft torquemeter for use in measuring torque transmission through a rotatable shaft, said torquemeter having an annular torque-sensing coil structure including an annular excitation coil arranged to be disposed coaxially of the shaft and a pickup coil associated with the excitation coil to be magnetically coupled to the excitation coil to provide an output signal varying as a function of variation in the magnetic coupling therebetween, the improvement comprising:

a tube coaxially fixed to the shaft and defining a magnetostrictive coupling portion;

means associated with said coupling portion and having an axial extent substantially greater than the axial extent of said coil structure for preventing as continuous annular conductive path through substantially the entirety of said coupling portion of the tube in all angular portions of the shaft without introducing a torque reading discontinuity; and

means for mounting said coil structure coaxially about said coupling portion for coupling said excitation and pickup coil through said coupling portion.

4,616,513

DUST COLLECTION

Harold Gibson; Gordon Lynch, both of Edinburgh; David Mark, Stow, and James H. Vincent, Haddington, all of Scotland, assignors to Coal Industry (Patents) Limited, London, England

Filed Apr. 22, 1985, Ser. No. 725,500

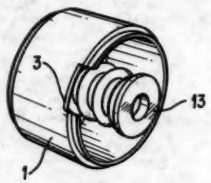
Claims priority, application United Kingdom, May 3, 1984, 8411325

Int. Cl.[4] G01N *1/24*

U.S. Cl. 73—863.23 **7 Claims**

1. A total dust sampler comprising a sampling head having a protruding lipped gas entry connecting with a filter mounted within the head, a gas exit connecting with the filter and seal-

ably engaging gas suction means, and drive means drivably engaging the sampling head which drive means is capable of



providing a continuous rotational movement of the sampling head.

4,616,514

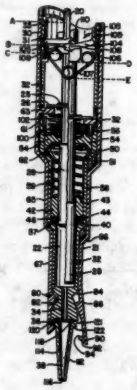
REPLACEABLE TIP ASSEMBLY FOR PIPETTE

Haakon T. Magnussen, Jr., Pinole, and Stephen J. Ruskewicz, Kensington, both of Calif., assignors to Rainin Instrument Co., Inc., Emeryville, Calif.

Continuation of Ser. No. 501,585, Jun. 6, 1983, abandoned. This application Dec. 20, 1985, Ser. No. 814,535

Int. Cl.[4] G01N *1/14*

U.S. Cl. 73—864.14 **26 Claims**



1. In a pipetting assembly of the type wherein a plunger reciprocates into and out of a chamber in a pipette body to displace air through a passageway to a detachable pipetting tip, the improvement comprising:

tip attachment means including a shell slidably disposed around said pipette body and including a plurality of spring biased flexible fingers having hooks for gripping said pipetting tip; and

annular tip sealing means disposed around said passageway at a lower end of said pipette body.

4,616,515

PROCESS AND DEVICE FOR AUTOMATIC SAMPLING OF BULK MATERIALS CONTAINED IN TRANSPORT VEHICLES

Daniel Dancoine, Herbaudiere de Saivres par, Saint-Maixent L'Ecole - 79400, France

Filed Aug. 20, 1984, Ser. No. 642,357

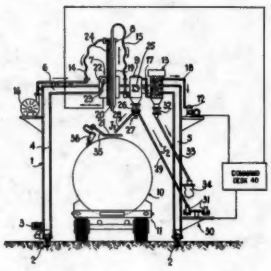
Claims priority, application France, Aug. 19, 1983, 83 13469

Int. Cl.[4] G01N *1/08, 1/14, 1/18*

U.S. Cl. 73—864.31 **25 Claims**

1. An automatic sampling device for sampling products in containers carried by at least one automobile vehicle using a mobile sampling probe, comprising:

(a) a travelling gantry movably attached to at least two rails, having two columns and an upper horizontal beam, wherein mobile means for supporting and horizontally moving said mobile sampling probe are attached to said upper horizontal beam and wherein said at least one automobile vehicle can be brought between said at least two rails;



(b) means for applying suction to an interior of said mobile sampling probe for drawing said product towards a temporary receiver;

(c) sample receiving means for receiving said product connected to said temporary receiver; and

wherein said means for applying suction and said sample receiving means are carried by said gantry and are connected to a control desk installed at a bottom portion of one of said columns of said gantry.

4,616,516

PUSH-BUTTON TUNER

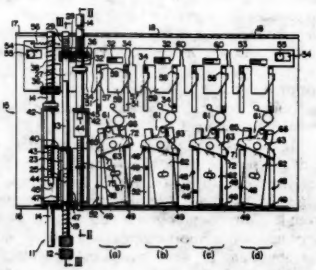
Tamaki Ohashi, Tokyo, Japan, assignor to Nihon Technical Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 19, 1984, Ser. No. 652,349

Claims priority, application Japan, Sep. 19, 1983, 58-171207; Sep. 19, 1983, 58-171208

Int. Cl.[4] H03J *5/12*

U.S. Cl. 74—10.33 **9 Claims**



1. A push-button tuner comprising a support, a tuning means mounted on said support in a manner so that said tuning means is movable to positions corresponding to tuned frequencies for producing the tuned frequencies, and a plurality of presettable tuning mechanisms for adjusting said tuning means to move selectively to positions respectively corresponding to specific frequencies, in which each of said tuning mechanisms comprises:

a rotatable operation member movable between a front non-actuation position and a rear actuation position, said

operation member being normally urged to said front non-actuation position, said operation member having a drive rotary body and a push-button provided at an end of said operation member, said push-button being used also as a rotating knob;

a rotatable tuning member having a driven rotary body for selectively engaging with said drive rotary body to rotate together with said drive rotary body, said rotatable tuning member being supported by said support in a manner so that said rotatable tuning member is normally urged to said front non-actuation position while it is movable between said front non-actuation position and said rear actuation position, said rotatable tuning member having a longitudinally extending threaded portion at a part of the surface thereof and a tuning piece engaged with said threaded portion, said tuning piece being movable in the frontward/rearward direction in response to the rotation of said tuning member;

said tuning means including a plurality of actuator plates engaging with said tuning piece of said tuning member in said rear actuation position to adjust said tuning means, each of said actuator plates cooperating with preset number of said tuning mechanisms, each of said actuator plates being provided with a variable tuning element; and

in which said push-button tuner further comprises a lock member for holding any one of said tuning members so as to permit the transmission of rotation between said drive rotary body and said driven rotary body when said one tuning member is located in said rear actuation position and for releasing said one tuning member held in said rear actuation position when another tuning member is disposed in said rear actuation position.

4,616,517

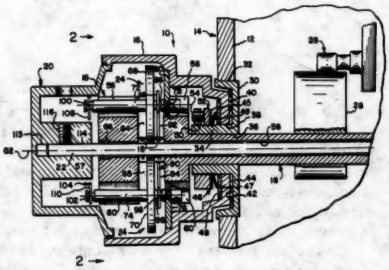
MONOAXIAL COARSE-FINE ADJUSTING MECHANISM FOR OPTICAL INSTRUMENTS, SUCH AS MICROSCOPES

Edward N. Esmay, Webster, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation of Ser. No. 451,901, Dec. 21, 1982, abandoned. This application Feb. 10, 1986, Ser. No. 828,585

Int. Cl.[4] F16H *35/18*; G02B *21/24*

U.S. Cl. 74—10.45 **9 Claims**



1. Apparatus for accomplishing coarse-fine adjustments in optical instruments, comprising:

a support member;

a coarse focus knob rotatably supported and frictionally engaged to said member, said knob having an internal bearing surface;

a coarse focus shaft coupled to said coarse focus knob, said shaft having first and second pair of slots defined therein for receiving and locating a pair of drive roller assemblies, said first pair of slots being formed longitudinally in said coarse focus shaft and said second pair of slots being formed transverse to said first pair of slots;

a fine focus shaft concentrically received in said coarse focus shaft, said coarse and fine shafts being coupled to a mechanism for translating rotary motion into linear motion;

a fine focus knob mounted to said fine focus shaft;

a pair of drive roller assemblies, each assembly including a friction wheel and an axle, said assemblies being received in said first and second pairs of slots such that said friction wheels engage said fine focus shaft and a portion of said axles engage said internal bearing surface of said coarse focus knob; and

biasing means mounted between said coarse focus shaft and said pair of drive roller assemblies, said biasing means including first and second resilient members, said first resilient member biasing said friction wheels against said fine focus shaft and said axles against said coarse focus knob internal bearing surface, said second resilient member biasing said axles against said longitudinal slots in opposite directions of rotation to thereby remove backlash upon rotation of said fine shaft in either direction, said friction wheels being capable of slipping on said fine shaft when resistance is encountered by said translating mechanism.

4,616,518

SLIDING-LINK MECHANISM

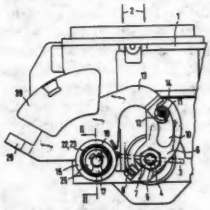
Hermann Nüsser, Markgröningen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 29, 1984, Ser. No. 645,375

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1983, 3338242

Int. Cl.[4] F16H *21/44, 51/02*

U.S. Cl. 74—96 **2 Claims**



1. A sliding-link mechanism for actuating a throttle device provided in a housing in an intake tube on an internal combustion engine, comprising a roller lever rotatably supported about a roller lever shaft attached to said housing and a variable-fulcrum lever connected at one end with a throttle shaft associated with said throttle device, said roller lever including a roller means constructed and arranged to engage an oblong slot groove in said variable-fulcrum lever, said roller lever shaft further having a hub including an aperture which engages an eccentric sleeve that is rotatable with respect to said hub, said eccentric sleeve further having a bearing bore extending eccentrically with respect to a jacket face of said eccentric sleeve, whereby said eccentric sleeve is slidably disposed on said shaft, said eccentric sleeve includes a shoulder and said hub includes a recess with said shoulder and said recess comprising interengaging sets of teeth to provide for relative adjustment of said roller lever and said variable-fulcrum lever.

4,616,519

MAGNETICALLY OPERATED POWER TRANSMISSION APPARATUS

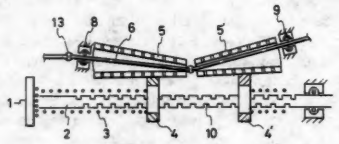
Tokuichiro Yoshida, 13-14 Iseche Kamasakiku, Kawasaki, Japan

Filed Mar. 26, 1984, Ser. No. 593,346

Claims priority, application Japan, Mar. 28, 1983, 58-52237

Int. Cl.[4] F16H *15/16, 13/12, 55/34*

U.S. Cl. 74—191 **6 Claims**



1. A magnetically operated or assisted power transmission apparatus for steplessly transmitting rotational force outputted from a prime mover to a power consuming machine or apparatus comprising:

a rotatably-mounted primary shaft operatively connected at a power input end thereof to the prime mover by way of coupling means, said primary shaft having an outer surface in which a spirally extending groove is formed,

a disc-shaped driving pulley displaceably fitted onto the primary shaft in operational engagement with said spirally extending groove, said driving pulley comprising a plurality of radially extending permanent magnets in spaced adjacent relation to one another with spacers of non-magnetic material interposed between adjacent ones of said magnets,

an expansive spring means disposed on the primary shaft so as to cause the driving pulley to be normally urged in a direction away from said power input end of the primary shaft,

a truncated cone-shaped driven pulley whose outer conical surface is adapted to come in rolling contact with the peripheral surface of the driving pulley, said driven pulley being made of non-magnetic material and having a number of rod-shaped magnetizable pieces embedded in the outer conical surface thereof so as to make a magnetic connection between the driving and driven pulleys, and

a rotatably-mounted secondary shaft made integral with the driven pulley, said secondary shaft extending at a certain inclination angle relative to the primary shaft and being operatively connected at one end thereof to a power consuming machine or apparatus by way of a universal joint.

4,616,520

ARRANGEMENT OF A BRAKE IN A WHEEL HEAD EQUIPPED WITH REDUCING GEAR

Friedrich Ehrlinger, Friedrichshafen; Karl-Hermann Katzorek, Tettnang; Peter Dziuba, Überlingen; Karl Veser, Friedrichshafen, and Peter Caspar, Oberteuringen, all of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Fed. Rep. of Germany

PCT No. PCT/EP83/00259, § 371 Date Aug. 23, 1984, § 102(e) Date Aug. 23, 1984, PCT Pub. No. WO84/02498, PCT Pub. Date Jul. 5, 1984

PCT Filed Oct. 5, 1983, Ser. No. 644,729

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1982, 3248250

Int. Cl.[4] F16H *57/10*

U.S. Cl. 74—325 **8 Claims**

1. A wheel head which comprises:

a wheel head housing forming a wheel hub;

a central shaft extending axially into said housing from a differential and subdivided axially within said housing into a terminal section and a driving section, said sections being provided with external formations of similar dimensions;

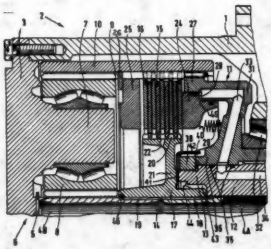
a planet carrier coupled to said housing and formed with planet shafts overhanging said terminal section and on which respective planet gears are journaled;

a sun gear formed on said terminal section and meshing with said planet gears;

a hollow shaft surrounding said planet gears and formed with internal toothing meshing with said planet gears and extending axially over both of said sections;

a hollow wheel carrier concave in the direction of said planet carrier, surrounding said driving section, spaced from said planet gears and said planet carrier and rotationally fixed to said hollow shaft and rotatable relative to said housing;

a brake disposed within said hollow shaft between said hollow shaft carrier and said planet carrier, said brake comprising a stack of inner and outer disks in axially interleaved relationship, and a pair of bracing disks at opposite ends of said stack and including a bracing proximal to said planet carrier and a further bracing disk guided on said hollow wheel carrier, said outer disks being rotationally coupled to said hollow shaft;



a hollow axle extending into said housing and surrounding a portion of said driving section whereby a further portion of said drive section proximal to said terminal section projects beyond said axle and is provided with said formations, said hollow shaft carrier being mounted on said axle;

a support for said inner disks formed with:

a sleeve having internal formations engaging said formations on said further portion of said driving section and on said terminal section for angularly coupling said sections together while enabling said terminal section to be removed and to be interchangeable with another terminal section with a sun gear of different diameter, said sleeve being disposed substantially between an end of said axle and said planet carrier,

a rim disposed radially outwardly of said sleeve at substantially the radial distance of said planet shafts from said central shaft sections and provided with teeth angularly coupled to said inner disks while enabling axial displacement thereof and

means connecting said rim with said sleeve; and

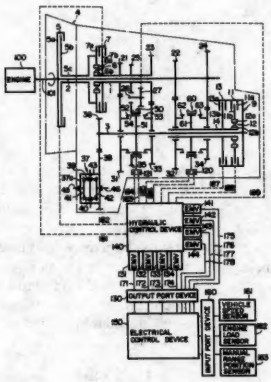
power assistance means for said brake received in said hollow shaft carrier and acting upon said further bracing disk.

4,616,521

TRANSMISSION CONTROL METHOD PROVIDING OVERLAPPED ENGAGEMENT OF POWER TRANSMISSION SYSTEMS

Teruo Akashi; Hiroshi Ito, and Shigemichi Yamada, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 25, 1983, Ser. No. 469,760
Claims priority, application Japan, Mar. 2, 1982, 57-33298
The portion of the term of this patent subsequent to Mar. 18, 2003, has been disclaimed.
Int. Cl.[4] B60K *41/18, 20/10*
U.S. Cl. 74—335 6 Claims



1. A method for controlling a transmission mechanism for a vehicle wherein:

said transmission mechanism comprises an input shaft; an output shaft; a first on-off clutch; a second on-off clutch; a first one way clutch; a second one way clutch; a first gear train having a first reduction gear ratio; a second gear train having a second reduction gear ratio smaller than said first reduction gear ratio; a third gear train having a third reduction gear ratio smaller than said second reduction gear ratio; a fourth gear train having a fourth reduction gear ratio smaller than said third reduction gear ratio; a first synchronizer which connects said input shaft and said output shaft via a series connection of said first on-off clutch, said first one way clutch, and said first gear train when said first synchronizer is shifted to a first side of a neutral position thereof so as to transmit rotational power from said input shaft to said output shaft in a normal rotational direction at a first speed stage and which connects said input shaft and said output shaft via a series connection of said first on-off clutch, said first one way clutch, and said third gear train when said first synchronizer is shifted to a second side of said neutral position so as to transmit rotational power from said input shaft to said output shaft in said normal rotational direction at a third speed stage; and a second synchronizer which connects said input shaft and said output shaft via a series connection of said second on-off clutch, said second one way clutch, and said second gear train when said second synchronizer is shifted to a first side of a neutral position thereof so as to transmit rotational power from said input shaft to said output shaft in said normal rotational direction at a second speed stage and which connects said input shaft and said output shaft via a series connection of said second on-off clutch, said second one way clutch, and said fourth gear train when said second synchronizer is shifted to a second side of said neutral position of said second synchronizer so as to transmit rotational power from said input shaft to said output shaft in said normal rotational direction at a fourth speed stage, wherein the method comprises:

shifting said transmission mechanism up from operation at said third speed stage to operation at said fourth speed stage by firstly disengaging said second on-off clutch,

secondly shifting said second synchronizer to said second side of said neutral position thereof; and

thirdly reengaging said second on-off clutch, with said first on-off clutch being kept as engaged and with said first synchronizer being also kept as shifted to said second side of said neutral position thereof; and

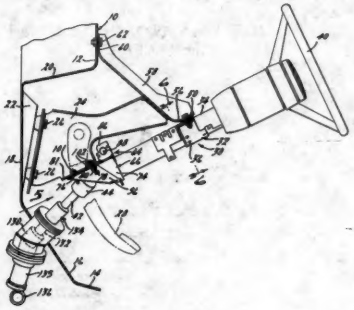
shifting said transmission mechanism down from operation at said fourth speed stage to operation at said third speed stage by firstly disengaging said second on-off clutch, secondly shifting said second synchronizer to said first side of said neutral position thereof, and thirdly reengaging said second on-off clutch.

4,616,522

STEERING COLUMN ENERGY ABSORBING RELEASE BUSHING AND DEFORMING BRACKET

George E. White, Mt. Clemens, and Dennis C. Heckel, West Bloomfield, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Mar. 8, 1985, Ser. No. 709,941
Int. Cl.[4] B62D *1/16*
U.S. Cl. 74—492 2 Claims



1. An energy absorbing steering column assembly for an automotive vehicle body, said steering column assembly comprising an axially extending upper steering shaft having its upper end connected to a steering wheel and its lower end connected by means of a lower shaft to a vehicle steering gear assembly by universal joint means, a tubular steering column jacket surrounding said upper shaft, an upper bracket fixed to said jacket intermediate its upper and lower ends, said upper bracket releasably supporting said jacket to said body by a plurality of releasably impact responsive capsules, the improvement wherein an energy absorbing sheet metal lower support bracket formed with a central collar portion defining a circular aperture, the lower end of said jacket extending through said aperture in concentric spaced relation, said lower bracket having a pair of flanged wings extending forwardly from diametrically opposite sides of said collar portion, each said wing joined for impact deformation to said collar portion at a right angled radiused juncture wherein each said wing extends in a vertically disposed plane parallel to the principal axis of said jacket, fixedly secured to said vehicle body, a bushing formed of rigid plastic material concentrically received in a press fit manner into said collar aperture, said bushing having a tubular body portion containing a central through bore, said through bore formed at its upper end with a counterbore recess sized to receive the forwrad end of said jacket in a press fit manner, said bushing formed with a plurality of resilient fingers extending outwardly from its leading

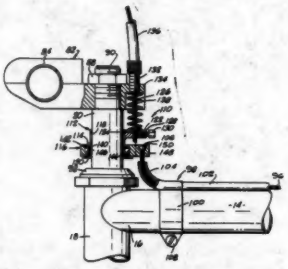
edge, each finger being radially depressible inwardly for assembly through said collar aperture, each said finger having its trailing free end juxtaposed said collar portion, said bushing formed with a plurality of tabs extending radially outwardly from said tubular body portion, said collar aperture including a tubular flanged rim concentrically spaced about said jacket with said flanged rim free edge extending rearwardly toward said steering wheel, a plurality of equally spaced tab receiving notches formed in said flanged rim, each said notch longitudinally aligned with an associated tab and sized so as to receive at least a portion of its associated tab therein, and wherein each said notch having a base defining a transverse shearing edge portion, such that upon the application of a predtermined load on said steering wheel said upper bracket initially is released from said capsules for forward travel in a guided manner relative to said vehicle body, whereby said jacket moves forwardly causing each said tab to be sheared-off by its associated collar member shear edge providing a first stage engergy absorption; and whereby upon said tabs being sheared off said jacket continuing to travel forwardly in a generally oblique manner contacting said collar portion whereby said wings are deformed about their radiused junctures providing a second stage energy absorption.

4,616,523

BICYCLE BRAKE CABLE COUPLING MEANS

Stephen D. Jones, 421 W. Parkwood Ave., La Habra, Calif. 90631

Filed Apr. 8, 1985, Ser. No. 721,902
Int. Cl.[4] F16C *1/10*
U.S. Cl. 74—501 **9 Claims**



1. A brake cable coupling means for use with a hand brake for the rear wheel of a bicycle wherein said brake is a scissor type of brake adapted to be activated by movement of a rear brake cable by pressure on a hand brake handle mounted on a handle bar secured to a stem of a front wheel fork rotatably mounted in a front post of said bicycle, said handle and said brake being connected therebetween by a cable through said coupling means wherein said last means includes;

an inner sleeve member slidably and rotatably mounted on said stem;

an outer sleeve member mounted around said inner sleeve and adapted to be independent of the rotation of said inner sleeve member yet vertically slidably yieldable simultaniously with the sliding movement of said inner sleeve;

said rear brake cable being formed into an upper portion and a lower rearwardly extending portion, said upper portion extending from said brake handle to said inner sleeve member, and said lower rearwardly extending portion extending from said outer sleeve to said rear brake; and

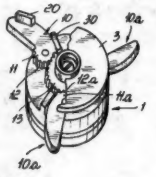
said brake cable coupling activatable to apply said rear brake no matter what degree of rotation said front wheel of said bicycle assumes and said cable will not interfer with said front post and said cable application to said brake.

4,616,524

COMPACT SIZE ACTUATING KNOB FOR ADJUSTING AND CLOSURE DEVICES, PARTICULARLY IN SKI BOOTS

Vincenzo Bidoia, Castelfranco Veneto, Italy, assignor to Nordica S.p.A., Montebelluna, Italy

Filed Mar. 4, 1985, Ser. No. 707,620
Claims priority, application Italy, Mar. 14, 1984, 21234/84[U]
Int. Cl.[4] G05G *1/10*
U.S. Cl. 74—553 **6 Claims**



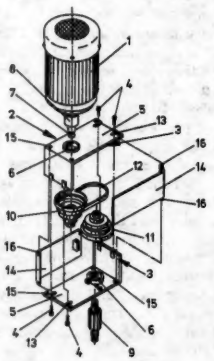
1. An actuating knob for adjusting and closure devices, particularly in ski boots, comprising a body of substantially cylindrical configuration, characterized in that it comprises at least one wing supported on said body for rotation about a substantially parallel axis to the axis of said body, said at least one wing being positionable at a home position, whereat it is contained within the outline of said body, and at an operative position, whereat it protrudes substantially radially from said body to increase the working diameter thereof.

4,616,525

MULTI-STEP REDUCTION GEAR ATTACHMENT FOR MULTI-PURPOSE ELECTROMOTORS

Reinhard Ueberschär, Bielefeld, Fed. Rep. of Germany, assignor to Hanning Elektro-Werke GmbH & Co., Oerlinghausen, Fed. Rep. of Germany

Filed Dec. 20, 1984, Ser. No. 683,806
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1983, 3347137
Int. Cl.[4] F16H *57/02*
U.S. Cl. 74—606 R **6 Claims**



1. Multistep reduction-gear attachment for multipurpose electric motors, with its casing-like gear box, which can be attached to a collar that surrounds the shaft of the motor and is intended for securing accessories, accommodating two axially parallel belt wheels or toothed wheels, of which one is screwed onto the motor shaft, which engages inside the the gear box when the motor is in operation, and the other onto a drill spindle that is inserted into the gear box from the opposite

side, characterized in that the gear box (2) consists of two similarly shaped angled components (3), each flank (5) of which has at the end a chuck (6) for the collar (8) of the electric motor (1) or for the drill spindle (9) and which are secured together with means (4 & 13) of attachment that can be loosened in such a way that the components can move toward each other along said flank.

4,616,526

TRANSMISSION DEVICE HOUSING CONSTRUCTION WITH SHAFT LUBRICATING OIL SHIELD COVER GENERATING LUBRICANT POOL

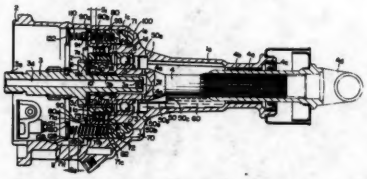
Kunio Morisawa, and Tadashi Kondo, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Feb. 21, 1984, Ser. No. 582,099

Claims priority, application Japan, Feb. 26, 1983, 58-031627; Mar. 9, 1983, 58-039745; Sep. 21, 1983, 58-174838

Int. Cl.[4] F16H 57/04

U.S. Cl. 74—606 R 8 Claims



1. In combination with a transmission device including a casing elongated towards a power transfer aperture defined therein, a first bearing mounted in said power transfer aperture, a second bearing, a power output member rotatably supported in said power transfer aperture by said first bearing, and a power output shaft within said casing, an outer end of which power output shaft is rotationally coupled to said power output member and an inner portion of which power output shaft is supported from said casing by said second bearing, said power output shaft being formed with an axially extending aperture for receiving supply of lubricating oil and with a radially extending aperture communicating at its radially inward end to said axially extending aperture, for squirting out lubricating oil from said power output shaft in generally radial directions as said power output shaft revolves, a lubricating oil shield cover comprising:

a base portion mounted to said casing at a position close to said second bearing on the side thereof towards said first bearing;

an extension portion elongated from said base portion in the direction of said first bearing and positioned under said power output shaft;

an end wall portion reaching upwards from the end of said extension portion closest to said first bearing towards said power output shaft, with the lowest point of the upper edge of said end wall portion closely approaching the power output shaft at an axial position along said power output shaft at which the diameter of said power output shaft is substantially less than it is at the axial part thereof at which said power output shaft is supported by said second bearing from said casing

said extension portion rising on either side of said power output shaft at least to the height of said lowest point of said upper edge of said end wall portion of said lubricating oil shield cover, and said extension portion further having an opening therein at a point not on the lowest part thereof and at an axial position corresponding to the axial position along said power output shaft of said radially extending aperture; and

a space for accumulating a pool of lubricating oil ejected from said radially extending aperture in said power output shaft being defined by said lubricating oil shield cover and said casing, so that as lubricating oil accumulates in said space it first can escape therefrom by overflowing over said lowest point of said upper edge of said end wall portion of said lubricating oil shield cover so as to flow to the side of the lower part of said extension portion of said lubricating oil shield cover facing said power output shaft, said lubricating oil pool at such a stage reaching so high as to wet the lower portion of said first bearing.

4,616,527

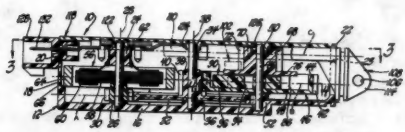
REMOTE ACTUATOR

Mark W. Frey, Mason; Dallas E. King, Centerville, and William C. Staker, Springfield, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 14, 1985, Ser. No. 690,968

Int. Cl.[4] F16H 57/00, 57/02

U.S. Cl. 74—625 2 Claims

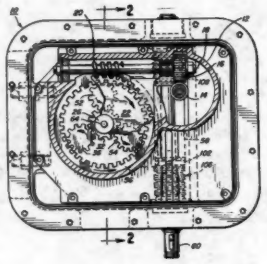


1. A remote actuator comprising, a housing including a planar base and a side wall perpendicular to said base defining an open side of said housing, said housing having a depth dimension perpendicular to said base substantially less than a length dimension parallel to said base, a first pinion gear rotatably supported on said housing is a first tier thereof adjacent said base, an intermediate gear rotatably supported on said housing in said first tier and meshing with said first pinion thereby to define a first gear reduction stage, a second pinion rotatably supported on said housing in a second tier thereof adjacent said first tier and rotatable as a unit with said intermediate gear, an output gear rotatably supported on said housing in said second tier and meshing with said second pinion thereby to define a second gear reduction stage, reversible electric motor means in said second tier connected to said first pinion and operative to drive said output gear in opposite directions between a pair of parked positions, a linear actuator in a third tier of said housing between said second tier and said open side bodily shiftable in either one of an extending direction and a retracting direction parallel to said length dimension between positively defined limits, means on said linear actuator defining a plurality of rack gear teeth, a rack pinion rotabaly supported in said housing in said third tier and meshing with said rack teeth whereby said rack pinion drives said linear actuator in either of said extending and said retracting directions, a slidable detent supported on said rack pinion for rotation as a unit therewith and for bodily shiftable movement relative thereto in a plane perpendicular to the axis of rotation of said rack pinion between an extended position and a retracted position, spring means between said rack pinion and said detent biasing said detent toward said extended position, means defining a follower on said detent, and means on said output gear defining a rigid arm having a pair of converging faces each engageable on said follower in a corresponding one of the directions of rotation of said output gear whereby said rack pinion is rotatable as a unit with said outpur gear while said converging faces are operable to cam said detent to said retracted position when said rack pinion is immobilized thereby to permit continued rotation of said output gear to the corresponding one of said parked positions.

4,616,528
VALVE ACTUATOR WITH CONTINUOUS MANUAL OVERRIDE

Richard F. Malinski, Schaumburg, and John Sikorcin, St. Charles, both of Ill., assignors to Vapor Corporation, Chicago, Ill.

Filed May 3, 1982, Ser. No. 374,382
Int. Cl.⁴ F16H *1/32*
U.S. Cl. 74—626 **12 Claims**



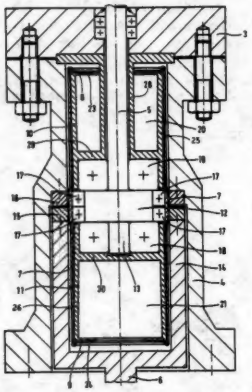
1. A valve actuator with continuously available manual override comprising;
a housing;
an input shaft journaled in said housing;
first worm gear set mechanically coupled between said input shaft and input signal means;
an epicyclic sun gear mounted on said input shaft;
first, second and third planetary gears in driven engagement with said sun gears being spaced approximately 120° from each other;
a first ring gear in engagement with and surrounding said first, second and third planetary gears;
an output member;
gear means engaging said output member and first ring gear;
manual override means engaging said sun gear for actuating said sun gear; and
means axially securing first, second and third planetary gears to said fourth, fifth and sixth planetary gears, respectively.

4,616,529
STRAIN-WAVE TRANSMISSION WITH TUBULAR STRAIN WHEEL

Fritz Heinemann, Friedrichshafen, Fed. Rep. of Germany, assignor to ZF-Herion Systemtechnik GmbH, Friedrichshafen, Fed. Rep. of Germany

PCT No. PCT/EP83/00148, § 371 Date Feb. 13, 1984, § 102(e) Date Feb. 13, 1984, PCT Pub. No. WO83/04429, PCT Pub. Date Dec. 22, 1983
PCT Filed Jun. 9, 1983, Ser. No. 589,102
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1982, 3222117
Int. Cl.⁴ F16H *37/02*
U.S. Cl. 74—640 **5 Claims**

1. A strain-wave transmission comprising:
a housing having an input side and an output side;
an input shaft extending axially into said housing at said input side;
an output shaft extending axially out of the housing at said output side;
a tubular deformable cylindrical strain wheel received in said housing and extending generally coaxial with respect to said shafts between said sides of said housing, said strain wheel having at an intermediate location along its length, gearing respectively engaging gearing on said housing and on said output shaft;
a strain-wave generator carried by said input shaft and disposed at said intermediate location for deforming said strain wheel to effect rotation of said output shaft at a speed different from that of said input shaft upon rotation of said input shaft;
a first cup-shaped support extending from said input side substantially to said intermediate location within said strain wheel and an end of said support rigidly affixed to a corresponding end of said strain wheel at the input side without engagement with the housing; and
a second cup-shaped support extending substantially from said intermediate locaton toward said output side of said



housing and having an end at said output side rigidly affixed to an end of said strain wheel at said output side, said first support being formed with a transverse bottom remote from its end affixed to said strain wheel and a tube section connected to said bottom, said tube section coaxially surrounding said input shaft and affixed at an end of said tube section remote from said bottom to said housing, each of said supports being open in the direction of the respective end affixed to said strain wheel, said second support having a transverse bottom remote from its end affixed to said strain wheel and guided on said input shaft.

4,616,530
HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION SUCH AS A CONTINUOUSLY VARIABLE TRANSMISSION

Yoshikazu Tanaka; Haruyoshi Kumura, both of Yokohama; Keiju Abo, Yokosuka; Sigeaki Yamamuro, Zushi, and Hiroyuki Hirano, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

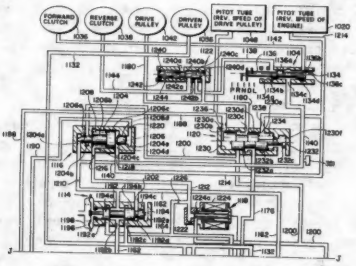
Filed Jan. 27, 1985, Ser. No. 574,385
Claims priority, application Japan, Jan. 31, 1983, 58-12894
Int. Cl.⁴ B60K *41/08*
U.S. Cl. 74—851 **5 Claims**

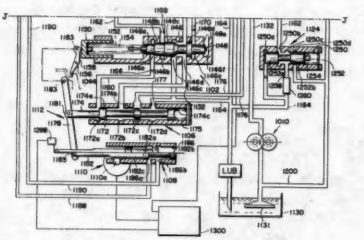
1. In an automotive vehicle having driven wheels:
an engine;
a transmission having an input member drivingly connected with the engine and an output member drivingly connected with the driven wheels, the transmission including frictional element means for interrupting a power delivery path between the engine and the driven wheels;
a source of pressurized fluid;
a manual valve communicating with said source of pressurized fluid and the frictional element means, said manual valve being shiftable to a forward drive position wherein said manual valve establishes a fluid feed line through which the pressurized fluid is supplied to the frictional element means from said source of pressurized fluid, a neutral position wherein said manual valve establishes a

drain fluid line through which the pressurized fluid is discharged from the frictional element means, and a reverse drive position;

means for delaying a shift to neutral in the transmission when said manual valve is moved to the neutral position from the forward drive position; and

fuel cut control means for interrupting the supply of fuel to





said engine as long as the engine speed is higher than a first predetermined value after a predetermined operating state of the automotive vehicle has been established and until the enginge speed drops to a second predetermined value that is lower than said first predetermined value, and allowing the resumption of the supply of fuel to said engine when said manual valve is shifted to the neutral position.

4,616,531

HYDRAULIC AND ELECTRONIC CONTROL SYSTEM FOR AN AUTOMATIC TRANSMISSION

Tsunehiko Ogasawara, Kariya; Yoshichika Arakawa, Nagoya; Koji Sumiya, Nishio, and Yoshikazu Sakaguchi, Anjo, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Aisin Warner Kabushiki Kaisha, Aichi, both of, Japan

Filed Mar. 14, 1984, Ser. No. 589,476

Claims priority, application Japan, Mar. 31, 1983, 58-56444

Int. Cl.[4] B60K *41/18*

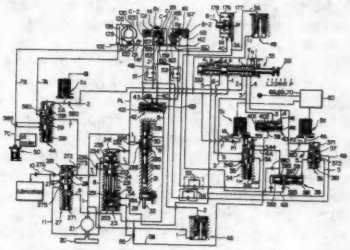
U.S. Cl. 74—866 **18 Claims**

1. In an automatic transmission equipped with a plurality of friction engaging devices for attaining a plurality of shift ranges by locking the elements of a gear mechanism, which is disposed between an input shaft and an output shaft, to a case, or by bringing the elements into and out of engagement with the input shaft or output shaft, or into and out of engagement with each other, said friction engaging devices including a first friction engaging device (C2) which takes part in achieving a reverse shift, and a second friction engaging device (B2) which participates in achieving parking and reverse, a control system for said automatic transmission which comprises:

sensing means for sensing shift position;

means for discriminating, based on a signal from said sensing means, a shift from the parking position to the reverse position; and

electronic control circuit means for controlling valves of a hydraulic circuit in such a manner that, when the shifting operation is discriminated to have taken place, said first



friction engaging device (C2) is engaged and said second friction engaging device (B2) is temporarily disengaged, followed by re-engaging said second friction engaging device (B2) upon passage of a predetermined length of time.

4,616,532

AUTOMATIC TRANSMISSION HYDRAULIC PRESSURE CONTROL SYSTEM WITH ONE-WAY FLUID DRAIN PASSAGE BYPASSING DOWNSHIFT TIMING SUBSYSTEM

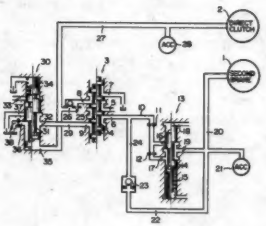
Takahiro Sakai, and Isamu Minemoto, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jan. 26, 1984, Ser. No. 574,144

Claims priority, application Japan, May 24, 1983, 58-92096

Int. Cl.[4] B60K *41/16*

U.S. Cl. 74—869 **1 Claim**



1. In an automatic transmission including a gear transmission mechanism comprising a first and a second hydraulic pressure actuated friction engaging device, which provides a certain lower speed stage when said first friction engaging device is engaged by supply of actuating hyraulic fluid pressure thereto and said second friction engaging device is disengaged by non-supply of actuating hydraulic fluid pressure thereto, and which provides a certain higher speed stage when said first friction engaging device is disengaged by non-supply of actuating hydraulic fluid pressure thereto and said second friction engaging device is engaged by supply of actuating hydraulic fluid pressure thereto,

a hydraulic fluid pressure control system, comprising:

a speed shift valve having a first, a second, a third, a fourth, and a fifth port, and a first valve element selectively positioned either to a first position to communicate said first port with said second port and said fourth port with said fifth port, respectively, or to a second position to communicate said first port with said fourth port and said second

port with said third port, respectively, said first port being supplied with a line pressure, while said fifth port is open to drain;

a downshift timing valve having a first port passage, and a second valve element driven by a governor pressure from a third position toward a fourth position against a biasing force so as to interrupt communication of said first port passage when the governor pressure is larger than a predetermined value;

an upshift timing valve having a second port passage, a sixth port, and a third valve element driven by a throttle pressure from a fifth position toward a sixth position against a force applied by a fluid pressure supplied to said sixth port so as to interrupt communication of said second port passage when the balance between the throttle pressure and the fluid pressure supplied to said sixth port is smaller than a predetermined value;

a first hydraulic pressure system for operating said first friction engaging device in relation to said second friction engaging device, including a first passage system which connects said first friction engaging device with said second port, a second passage system which drains said third port, and a third passage system for interrelating operation of said first friction engaging device with that of said second friction engaging device, said first passage system including a parallel connection of a first and a second passage at a middle portion thereof, said first passage including a parallel connection of said first port passage and a first throttling element at a middle portion thereof and further a second throttling element connected in series with said parallel connection of said first port passage and said first throttling element at a middle portion thereof, said second passage including a first one way valve at a middle portion thereof, said first one way valve allowing fluid to flow therethrough only in a direction from said first friction engaging device toward said second port, said second passage system including a third passage which includes a parallel connection of said second port passage and a third throttling element therein, said third passage system including a fourth passage which connects said sixth port with said second friction engaging device; and

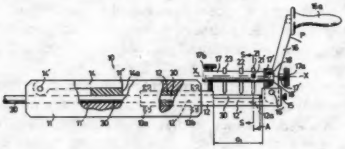
a second hydraulic pressure system for operating said second friction engaging device, including a fifth passage which connects said second friction engaging device with said fourth port, said fifth passage including a parallel connection of a fourth throttling element and a second one way valve at a middle portion thereof, said second one way valve allowing fluid to flow therethrough only in a direction from said second friction engaging device toward said fourth port.

4,616,533

STRIPPING DEVICE FOR COAXIAL CABLES

Hans Wiener, Täby, and Hans Undin, Akersberga, both of Sweden, assignors to C. A. Weidmüller GmbH & Co., Detmold, Fed. Rep. of Germany

Filed Aug. 1, 1984, Ser. No. 636,541
Claims priority, application Sweden, Aug. 26, 1983, 8304627
Int. Cl.[4] H02G *1/12*
U.S. Cl. 81—9.41 **27 Claims**



1. A stripping device for coaxial cables, comprising:

an elongate handle member;

an elongate guiding track member for a terminal portion of a coaxial cable to be stripped, said guiding track member exposing a part of the surface of the insulating sheathing of an inserted cable for treatment and extending between a first end, attached to the handle member, and a second end, remote from the handle member;

an elongate knife holder movably attached to said guiding track member, and at least two knife means arranged spacedly in said knife holder for perfoming in said exposed insulation parts a short incision which by relative rotation of the cable and the knife holder may be extended to the whole circumference of the cable; and

a locking means; wherein;

the handle member is provided with a through-opening for the cable;

the locking means is provided in association with the handle member to temporarily non-rotarily lock a cable inserted in said through-opening with the handle member;

the guiding track means and the knife holder are with the aid of a crank means jointly rotatable relative to the handle member; and

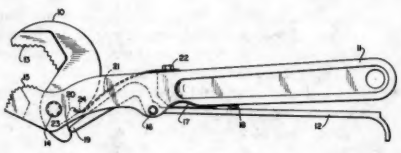
the knife holder is settable relative to the guiding track member so that in the initial phase of a stripping operation, only the knife located nearest to said second end of the guiding track member and performing the deepest incision is brought into engagement with the cable and a translatorial motion of the insulation caused by such incision is not impeded by other knives in engagement with the cable.

4,616,534

CLOSED END WRENCH

Sea C. Park, and In Pio Park, both of 3836 Birchwood, Skokie, Ill. 60076

Filed Oct. 23, 1984, Ser. No. 664,039
Int. Cl.[4] B25B *13/28*
U.S. Cl. 81—99 **1 Claim**



1. A wrench comprising

a body member having a lower jaw disposed at one end thereof,

a head member having a spring engaging protrusion surface and a base engaging surface, said head member being pivotally connected to the body member in the vicinity of the lower jaw and defining an upper jaw,

a handle member pivotally connected to the body member,

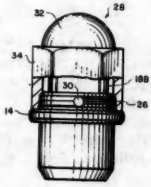
a biasing spring disposed between said body member and said handle member for biasing said handle member away from said body member, said handle member containing a lever engaging end portion which slidably engages the base engaging surface of the head member for separating the upper jaw of the head member from the lower jaw of the body member through the squeezing of the handle member toward the body member against the bias of the biasing spring and

a retaining spring attached at one end to the body and at an indent portion at the other end with the spring engaging protrusion surface of the head member, whereby, when the handle is released, the upper jaw of the head member is caused to close toward the lower jaw by the action of the retaining spring.

4,616,535
TAMPER-PROOF THREADED FASTENINGS

Ezio R. Chiavon, 17 Walnut La., Harrison, N.Y. 10528

Continuation of Ser. No. 476,031, Mar. 17, 1983, abandoned.
This application Jul. 11, 1985, Ser. No. 754,064
Int. Cl.[4] B25B *13/06*
U.S. Cl. 81—121.1 19 Claims

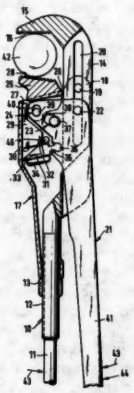


1. An anti-theft fastening device for securing an automobile wheel to a vehicle, said fastening device including a head portion defining a predetermined configuration on the outer periphery thereof adapted to complement the configuration of a tool for removing said head portion from an automobile wheel, and a cap removable mounted over said head portion to conceal said predetermined configuration defined on said head portion, the combined weight of said head portion and said cap being substantially equal in weight to the weight of conventional lug nuts mounted to said automobile wheel.

4,616,536
WRENCH

Fritz Knebel, Limburgerhof, and Rudolf Dassel, Gevelsberg, both of Fed. Rep. of Germany, assignors to Beler-Dowiday GmbH Werkzeug-Union, Fed. Rep. of Germany

Filed Dec. 9, 1985, Ser. No. 806,978
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1984, 3444725
Int. Cl.[4] B25B *13/18*
U.S. Cl. 81—128 11 Claims

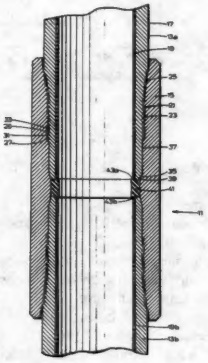


1. A wrench comprising a first arm carrying a first jaw, a second arm carrying a second jaw, first means for articulately connecting said first and second arms together, means for pivotally connecting said second jaw to said second arm, two stop means for limiting the pivotal movement of said second jaw relative to said second arm in two opposite directions of second jaw movement, a slider, second means for articulately connecting said slider to said second arm, means for movably connecting said slider to said first arm to thereby vary the distance between said first and second jaws, at least one of said stop means is carried by a slide member, a locking element constructed and arranged for moving said one stop means to an operative position thereof to contact said second jaw, and means for connecting said locking element to said second arm whereby relative movement of said second arm moves said locking element to a position freeing said slide member for movement to an inoperative position of said one stop means preventing contact thereof with said second jaw.

4,616,537
PIPE CONNECTION

Robert A. Axford, Houston; Edgar C. Wood, Jr., Huntsville, and Herbert F. Brandana, Spring, all of Tex., assignors to AWB, Inc., Houston, Tex.

Division of Ser. No. 481,797, Apr. 4, 1983, Pat. No. 4,568,113.
This application Oct. 2, 1985, Ser. No. 782,977
Int. Cl.[4] B23C *1/00*; B23G *1/22*
U.S. Cl. 82—5 2 Claims



1. A method of threading a tubular member to form an external continuous helical thread having a first axial length parallel to the axis of said tubular member and a second axial length with an angle of taper with respect to said axis of said tubular member, said helical thread having a form including stabbing and load flanks and an axially extending crest and root, wherein throughout said thread, lead is constant as measured along the load flanks and the length of said crest and the depth of said load flank are constant, which comprises the steps of:

(a) rotating said tubular member at a substantially constant speed of rotation about the axis thereof;

(b) positioning a thread cutting tool adjacent the end of said tubular member, said thread cutting tool including a leading edge for cutting the stabbing flank, a bottom edge for cutting the root, a trailing edge for cutting the load flank, and a top edge for cutting the crest;

(c) moving said thread cutting tool at a substantially constant linear speed toward and along said tubular member in a direction parallel to the axis of said tubular member to cut said first axial length;

(d) when said thread cutting tool has moved said first axial length, moving said thread cutting tool radially outwardly in a direction perpendicular to the axis of said tubular member at substantially constant speed while continuing to move said thread cutting tool at said substantially constant speed in the direction parallel to the axis of said tubular member so that said thread cutting tool moves along said angle of taper to cut said second axial length;

(e) displacing said thread cutting tool axially toward said tubular member a distance equal to the difference between the lengths of the crests in the first axial length and the crests in the second axial length;

(f) moving said displaced thread cutting tool at a said substantially constant linear speed toward and along said tubular member in the direction parallel to the axis of the tubular member to shorten the crests in said first axial length;

(g) and moving said thread cutting tool rapidly radially outwardly in the direction perpendicular to the axis of the tubular member after shortening the crests in said first axial length to clear the threads in said first axial length.

4,616,538

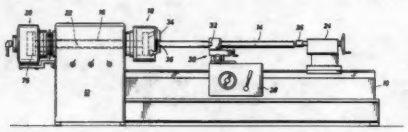
CHUCK ASSEMBLY

Norbert Hessbrüggen, Salach, Fed. Rep. of Germany, assignor to UMA Corporation, Houston, Tex.

Filed Apr. 27, 1984, Ser. No. 604,921

Int. Cl.[4] B23B *31/00*

U.S. Cl. 82—40 R **35 Claims**



1. An improved chuck assembly for a lathe apparatus comprising:

a base structure;

first holding means for selectively radially gripping the side surface of a workpiece;

second holding means for selectively forcibly axially engaging an end surface of such workpiece independently of said first holding means; and

first and second means connecting said first and second holding means respectively to said base structure for movement independently of each other; said first holding means being both radially and axially movable and said second holding means being axially movable,

actuator means operatively connected to said first and second holding means for effecting such selective independent movement.

4,616,539

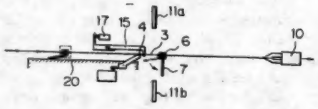
METHOD OF CUTTING SLIDE FASTENER CHAIN

Youichi Horikawa, Toyama, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Jul. 19, 1985, Ser. No. 756,652

Int. Cl.[4] B26D *5/28*

U.S. Cl. 83—42 **2 Claims**



1. In a method of cutting a fastener chain wherein said fastener chain includes space portions where no element is present, said space portions being provided at regular intervals along continuous interlocking element trains, and sliders each of which has a pull and is inserted into each single length of said interlocking element trains lying between two adjacnet space portions, said fastener chain being fed in a horizontal direction in such a manner that the bottom end of each of the slide fastener sections is disposed forwardly of the upper stop of the same fastener section in terms of the feeding direction, and being cut into individual slide fasteners at the position of said space portion,

an improvement characterized by comprising the steps of feeding said fastener chain to a cutting device in the state wherein the side of said fastener chain on which said pull of said slider inserted in said fastener chain is located faces downward and said slider is in contact with or in close proximity to said upper stop, and hanging said pull in such a manner as to be parallel to the cutting direction of said cutting device when said space portion reaches said cutting device.

4,616,540

METHOD AND APPARATUS FOR MAKING TUBES FORMED WITH HOLES IN THEIR PERIPHERAL WALL

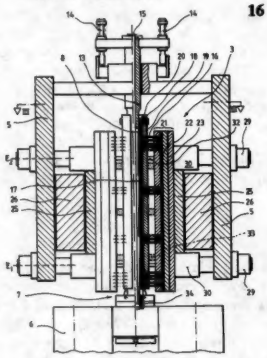
Alfred Morhard, Koenigsberger Strasse 24, D-7272 Altensteig-Walddorf, Fed. Rep. of Germany

Filed May 9, 1984, Ser. No. 608,596

Claims priority, application Fed. Rep. of Germany, May 11, 1983, 3317313

Int. Cl.[4] B26F *1/04*

U.S. Cl. 83—54 **16 Claims**



1. An apparatus for perforating an elongate tube, comprising: an elongate mandrel having first and second ends and support means cooperable with said first end of said mandrel for supporting said mandrel, the tube being axially slidable over said second end of said mandrel, said mandrel including two elongate, axially extending backing elements and means for effecting radially outward movement of said backing elements in opposite directions so that said backing elements engage the inner surface of the tube at diametrically opposite regions thereof which are each to have holes punched therein; two elongate, axially extending guide elements which are provided on opposite sides of and are supported for radial movement toward and away from said mandrel, each said guide element being approximately angularly aligned with a respective one of said backing elements and being engageable with the exterior surface of the tube; a plurality of punch elements supported on ech of said guide elements at axially spaced locations therealong for generally radial movement toward and away from said mandrel; actuating means which can effect simultaneous radially inward movement of at least one of said punch elements on each of said guide elements, said actuating means including selecting means for selecting a predetermined group of said punch elements on each said guide element which are simultaneously moved radially inwardly by said actuating means, wherein each said punch element which is excluded from said predetermined groups remains in a radially outer position during radially inward movement of said predetermined groups of punch elements, each of said punch elements of said preselected groups punching a hole through said tube during said radially inward movement thereof; and means which cooperates with said second end of said mandrel as said actuating means effects radially inward movement of said punch elements for holding said second end of said man-

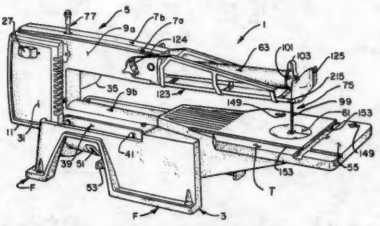
drel against movement in radial directions as said punch elements punch holes in the tube.

4,616,541

WALKING BEAM SCROLL SAW

Curtis J. Eccardt, St. Charles County, and Richard B. Brundage, St. Louis County, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Aug. 13, 1984, Ser. No. 640,399
Int. Cl.[4] B23D *49/00*
U.S. Cl. 83—98 **9 Claims**



1. A walking beam scroll saw having a base, a frame carried by said base, said frame having a generally vertically extending rear portion, a top frame portion cantilevered forwardly from said rear portion, and a bottom frame portion cantilevered forwardly from said rear portion with said top and bottom frame portions being spaced apart vertically from one another, an induction electric motor secured directly to said rear frame portion, said motor having a drive shaft extending inwardly of said frame, an upper beam pivotally mounted with respect to said upper frame portion intermediate the ends of said upper beam, a lower beam pivotally mounted with respect to said bottom frame portion intermediate the ends of said lower beam, a blade extending between the outer ends of said upper and lower beams, means interposed between said upper and lower beams adjacent the other ends thereof for placing said blade under tension, eccentric linkage means interconnecting said motor shaft and one of said beams at the portion of said one beam proximate said tension means for reciprocably, pivotally moving said one beam up and down with respect to said frame and, via said blade and said tensioning means, effecting up and down movement of said other beam, each of said beams being of hollow, circular, tubular construction so as to minimize the mass of said beams and to minimize vibrations, and yet so as to maximize the stiffness of the beams in both vertical and lateral direction, said saw further comprising means for positively holding said blade on the outer end of each of said beams, said blade holding means comprising a one-piece member having a slot therein for receiving one end of said blade, means for securing said blade with respect to said blade holding member, the latter having a pair of supports on opposite sides thereof, said supports being pivotally, rockably supported in a portion of said beam for rocking in a substantially fore and aft direction as said beams are reciprocated upwardly and downwardly.

4,616,542

FLYING BUCKSAW APPARATUS

John E. Hards, Delta, Canada, assignor to Brunette Machine Works, Ltd., New Westminster, Canada

Filed Sep. 7, 1984, Ser. No. 648,380
Int. Cl.[4] B27B *5/00*
U.S. Cl. 83—155 **8 Claims**

1. Apparatus for bucksawing a log along a predetermined cutting line while the log is being directed in an endwise, downstream direction along a substantially horizontal path of travel, comprising:

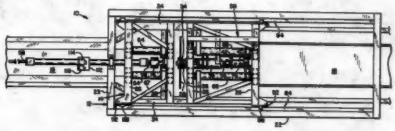
saw means for sawing the log, said saw means being initially disposed above said path of log travel;

means for displacing said saw means downwardly into and upwardly out of said path of log travel to effect cutting of the log;

clamp means for releasably gripping the log;

means for reciprocating said saw means and said clamp means along said path of log travel;

control means including means for causing said saw means to be displaced into said path of log travel only when said saw means is traveling at the same velocity as the log, means for causing said clamp means to grip the log only when said clamp means is traveling at said log velocity and for causing said clamp means to release the log after a cut has been effected along the cutting line, and means for causing said reciprocating means to accelerate said saw means and said clamp means in a downstream direction up



to said log velocity for sawing the log, and then causing said reciprocating means to index said saw means and said clamp means back in an upstream direction after said clamp means has released the cut log;

substantially horizontal log infeed support means for supporting the log from below and for conveying the log along said path of log travel at a first height;

log outfeed support means for supporting the log from below after it has been cut and for conveying the cut log along said path of log travel at a height which is lower than said first height; and

wherein said clamp means includes means for supporting the log such that a space is defined below the log during at least a portion of the path of log travel, said space extending in a downstream direction from the cutting line, and wherein said control means includes means for causing said saw means to complete cutting of the log when the cutting line is supported over said space.

4,616,543

APPARATUS FOR WORKING ON WOVEN FABRIC WOUND ON A SUPPLY ROLL

Heinz J. Gerber, West Hartford, Conn., assignor to Gerber Scientific, Inc., South Windsor, Conn.

Continuation-in-part of Ser. No. 284,783, Jul. 20, 1981, abandoned. This application May 7, 1984, Ser. No. 607,618
Int. Cl.[4] D06H *7/00*
U.S. Cl. 83—175 **13 Claims**

1. Apparatus for working on woven fabric wound on a supply roll and comprising a table defining a supporting surface upon which fabric may be spread, a fabric spreader for carrying a fabric supply roll and supported for movement in one and an opposite direction longitudinally of said supporting surface for spreading fabric from the supply roll onto the supporting surface, means for moving said fabric spreader in one and an opposite direction longitudinally of said supporting surface, means for paying-off fabric from the supply roll and

onto said supporting surface as said fabric spreader moves longitudinally of said supporting surface, means for vibrating a portion of the fabric located between said supply roll and said supporting surface which portion extends across the full width of said fabric, means for continuously varying the frequency of vibration of said vibrating means instrument means for performing a work operation on the fabric spread on said supporting surface, and means for moving said instrument means longitudinally and transversely of said supporting surface and in working relation to fabric spread on said supporting surface to perform said work operation on the fabric spread on said supporting surface.

4,616,544

CUTTING MACHINE FOR PREPARING MODELS FOR SPECTACLE LENSES

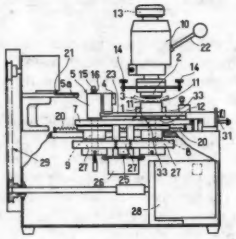
Niro Kato, Sabae, Japan, assignor to Kabushiki Kaisha Kato Kogei, Japan

Filed Feb. 5, 1985, Ser. No. 698,413

Claims priority, application Japan, Jun. 18, 1984, 59-91376; Nov. 1, 1984, 59-231977; Dec. 19, 1984, 59-269141

Int. Cl.[4] B26D *5/00*

U.S. Cl. 83—413 **9 Claims**



1. A cutting machine for preparing a model for spectacle lenses comprises:

a base rotatable about its axis by drive means and provided with needle-like projections in predetermined positions, the base having concentrically placed thereon a jig with the needle-like projections engaged in holes formed in the jig in coincidence with the projections, the jig being adapted to fixedly hold a real spectacle lens concentrically placed thereon and serving as a model lens,

a clamp rotatable with the base and the lens for holding the lens between the base and the clamp by elastic pressing means,

a profiling member adapted to contact the outer periphery of the lens held between the base and the clamp,

a rotary head rotatable with the base at the same speed as the base by drive means about an axis parallel with the axis of the base for holding a model work thereon concentrically therewith, and

a stationary cutter for cutting the work on the rotary head,

wherein the axis of the combination of the base and the clamp, the point of contact of the profiling member with the outer periphery of the lens, the axis of the rotary head and the point of contact of the cutter with the work are aligned in a plane,

wherein one of the profiling member and the combination of the base and the clamp is slidingly movable in the direction of alignment of the axes and the contact points relative to the other which is stationary such that the rotary head also moves in the direction of alignment in correspondence with the movable one, and

wherein the movable one has connected thereto a spring for biasing the movable one so that the profiling member comes into contact with the outer periphery of the model relative to each other.

4,616,545

CUTTER FOR A WELDING APPARATUS

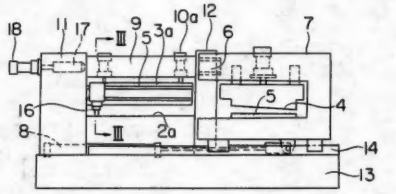
Kazuo Katou, Okayama; Susumu Mizugami; Mamoru Tabuchi, both of Kurashiki; Masayuki Nakamura, Hyogo; Toshiyuki Kobayashi, Suita, and Naotake Ritoh, Minoo, all of Japan, assignors to Kawasaki Steel Corporation and Mitsubishi Denki Kabushiki Kaisha, both of, Japan

Filed Nov. 8, 1984, Ser. No. 669,326

Claims priority, application Japan, Mar. 11, 1983, 58-41352

Int. Cl.[4] B26D *5/04*; B23K *11/00*

U.S. Cl. 83—558 **10 Claims**



1. A cutter for a welding apparatus in which a welding workpiece is cut by being moved into a welding position in said apparatus, said cutter comprising in combination:

a C-shaped shear frame having an upper pendant portion and a lower jaw separated by an opening which forms the gap in the C-shape of the shear frame;

means (1) for moving said shear frame between welding and non-welding positions;

a mechanism spanning said upper pendent portion and said lower jaw for resisting the reactive force created by said upper and lower blades during cutting;

a lock pin housed in said lower jaw and movable between lock and unlock positions; and

a lateral hole in a free end of said mechanism for receiving said lock pin in its locked position, thereby retaining said mechanism in a position spanning said upper pendent portion and said lower jaw.

4,616,546

ELECTRONIC MUSICAL INSTRUMENT FORMING TONES BY WAVE COMPUTATION

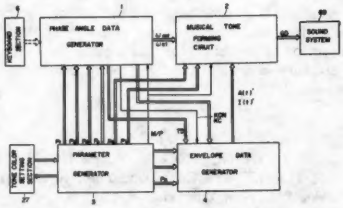
Yasuji Uchiyama, Hamamatsu, and Hideo Suzuki, Kami, both of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 434,230, Oct. 14, 1982, abandoned. This application Mar. 29, 1985, Ser. No. 718,186

Claims priority, application Japan, Oct. 15, 1981, 56-164443

Int. Cl.[4] G10H *1/00*

U.S. Cl. 84—1.01 **6 Claims**



1. An electronic musical instrument comprising:

time channel providing means for providing repeated cycles of a plurality of time slots, each correspondingly located time slot over the repeated cycles constituting each time-division-multiplexed time channel;

tone formation assigning means for assigning to each one of said time channels tone formation of each one of musical tone signals to be formed respectively defining individual note pitches and tone colors;

at least first and second signal computing means for computing in combination each said one musical tone signal per each said one time channel using at least two cycles of the time slots as a unit processing perid, in which in the first cycle of said at least two cycles said first signal computing means executes per each said one time channel a first sub-computation according to a first mathematical function to produce a first wave signal for the assigned said one musical tone signal whereas in the second cycle of said at least two cycles said second signal computing means executes per each said one time channel a second sub-computation according to a second mathematical function to produce a second wave signal for the assigned musical tone signal utilizing the result of said first subcomputation as an argument in said second sub-computation; and

musical tone wave forming means for forming a musical tone wave signal having an individual note pitch and a tone color based on the result of said second wave signal.

4,616,547

IMPROVISER CIRCUIT AND TECHNIQUE FOR ELECTRONIC MUSICAL INSTRUMENT

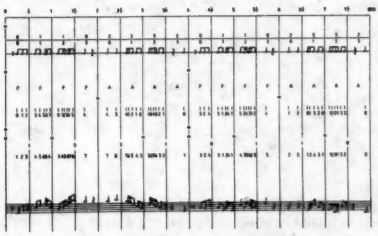
George M. Mancini, E. Setauket, N.Y., and Rudolph A. Huber, Trossingen, Fed. Rep. of Germany, assignors to Matth. Hohner AG, Trossingen, Fed. Rep. of Germany

Filed Jan. 31, 1985, Ser. No. 696,927

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1984, 340355

Int. Cl.[4] G10H *1/40, 7/00*

U.S. Cl. 84—1.03 **13 Claims**



1. An improvisation circuit for use in an electronic musical instrument comprising:

first memory means, said first memory means having stored therein tone duration data;

first random address generator means, said first random address generator means being coupled to said first memory means and generating address information which causes tone duration data to be read therefrom;

second memory means, said second memory means having tone pitch data stored therein;

second random address generator means, said second random address generator means being coupled to said second memory means and generating address information for causing tone pitch data to be read from said second memory means;

means responsive to the data read from said first and second memory means under the control of said address generator means for producing tone generator command signals, said command signals containing tone pitch and rhythm information;

first control signal generator means for providing a control input to said first random address generator means commensurate with a selected basic rhythm; and

second control signal generator means for providing a control input to said second random address generator commensurate with a selected tonality whereby said command signals means be commensurate with variations on said selected basic rhythm and tonality.

4,616,548

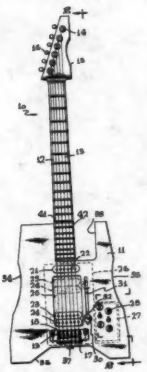
GUITAR COMPOSED OF HIGH STRENGTH-TO-WEIGHT RATIO MATERIAL

Arndt S. Anderson, 9500 Oso St., Chatsworth, Calif. 91311

Filed Mar. 26, 1984, Ser. No. 593,695

Int. Cl.[4] G10H *3/18*

U.S. Cl. 84—1.16 **11 Claims**



1. An electronic stringed musical instrument comprising:

an instrument body having a fret board outwardly projecting from an edge marginal region of said body;

a plurality of strings extended across said body and fret board having opposite ends of said strings fixed to said body and the free end of said fret board;

electronic pick-up means carried on said body in close proximity to said strings for sensing vibrations thereof and generating electrical signals in response thereto; and

said body composed of an electrically conductive material operably coupled to said electric pick-up means constituting a massive ground therefor.

4,616,549

MUSIC PLAYING DEVICE

Wei-Hsin Lan, No. 45-12, Te Yang Road, Jiau Hsi Country, Yi Lan Hsien, Taiwan

Continuation-in-part of Ser. No. 701,484, Feb. 14, 1985. This application Jun. 7, 1985, Ser. No. 742,355

Int. Cl.[4] G10F *1/06*

U.S. Cl. 84—94 R **8 Claims**

1. A music playing device comprising:

a music composition cylinder member having a plurality of parallel lines arranged circumferentially therearound and a plurality of rows of apertures, each row of apertures being arranged perpendicular to said parallel lines and being generally equally spaced;

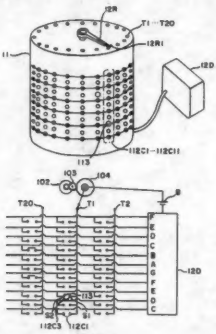
a plurality of pins adapted to be selectively and removably inserted into said apertures; and

means for producing sounds of various pitch operable in association with said cylindrical member according to the arrangement of said pins in said apertures, said sound producing means comprising:

a pair of first and second electrical contacts arranged in connection with each one of said apertures and being operable to become electrically closed when one of said plurality of pins is inserted into said aperture,

a plurality of contact terminals each connecting said first electrical contact of each pair of electrical contacts of one row of said rows of apertures;

a sound producing unit having a plurality of input terminals each being adapted to cause said sound producing unit to produce sound of a selected pitch when electric power is supplied thereto, each said input terminal being electrically connected to said second electrical contact of each pair of electrical contacts positioned along one of said parallel lines;



means for supplying electric power to said sound producing unit;

a rotary arm rotatably arranged with respect to said cylindrical member and capable of coming into contact with said contact terminals in a sequential order when rotated, said rotary arm being electrically connected between said sound producing unit and said means for supplying electric power; and

means for rotating said rotary arm.

4,616,550

STRING SUPPORT AND NECK DEVICE FOR STRINGED INSTRUMENT

Roger Lacroix, 2, rue de P. J. Proudhon, Villeurbanne, F-69100, and Yves Argant, 8, rue Pierre Robin, Lyon, F-69007, both of France

PCT No. PCT/FR83/00237, § 371 Date Jul. 30, 1984, § 102(e) Date Jul. 30, 1984, PCT Pub. No. WO84/02218, PCT Pub. Date Jun. 7, 1984

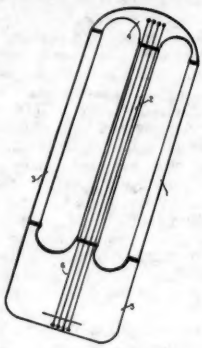
PCT Filed Nov. 29, 1983, Ser. No. 641,966

Claims priority, application France, Nov. 29, 1982, 82 20168

Int. Cl.[4] G10D *1/00*

U.S. Cl. 84—173 **11 Claims**

1. A musical instrument including a string and neck support device, said musical instrument having at least one neck and a plurality of strings, said support device comprising at least one lateral arm positioned between a head of said musical instrument and a body of said musical instrument, said at least one arm comprising means for at least partially freeing said at least one neck from mechanical stresses applied thereto, wherein said strings are tensioned between said instrument head and said instrument body, said at least one neck being rigidly yet detachably connected to said head and said body, said head and said body comprising means for rigidly and detachably receiving first and second ends, respectively, of said at least



one neck, said instrument further comprising means for adjusting the spacing between said strings and said neck.

4,616,551

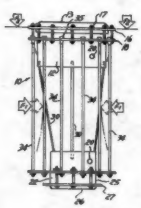
NADA DRUM AND ASSEMBLY

Steven Bookvich, 5300 Walnut, Apt. 2, Oakland, Calif. 94616

Filed Dec. 3, 1984, Ser. No. 677,366

Int. Cl.[4] G10D *13/02*

U.S. Cl. 84—411 A **27 Claims**



1. An adjustable pitch drum having a dual drum shell, comprising:

a large shell having an outside end;

a small shell having an integral flat disk portion and a protruding end;

support bars having a stem portion located at both ends, the stem portion of said support bars being affixed at one end to said small shell and at the opposite end to said large shell by fastening means;

a small drum head, said small drum head being disposed over the protruding end of said small shell;

a small head rim, said small head rim being disposed over said small drum head and cooperatively connected to the flat disk portion of said small shell by attaching means;

a large drum head, said large drum head being disposed over the outside end of said large shell;

a large head rim, said large head rim being disposed over said large drum head;

a floating suspension ring, said floating suspension ring being positioned between said large head rim and the flat disk portion of said small shell and cooperatively connected to said large head rim by attaching means; and

tension straps, said tension straps being affixed to said floating suspension ring and the flat disk portion of said small shell by connecting means;

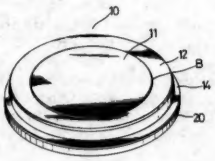
whereby, said large drum head can be replaced without disconnecting any of said tension straps.

4,616,552

JAZZ DRUMHEAD

Chan-Hwei Jang, 7, Lane 6, Kuang Ming, Hsi Chuan Li, South Dist., Taichung, Taiwan (400)

Filed Dec. 10, 1985, Ser. No. 807,152
Int. Cl.[4] G10D *13/02*
U.S. Cl. 84—414 1 Claim



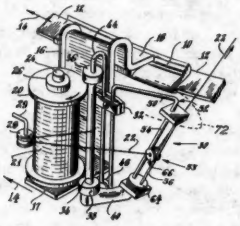
1. A jazz drumhead, comprising:
a central part;
a circumferential part; and
a stepped and curved buffer ring formed by compression moulding and set between said circumferential part and said central part to make the central part 1–1.2 mm higher than the circumferential part.

4,616,553

FAST-MOVING EYELET GUIDE FOR A GROUP OF BRAIDABLE STRANDS IN A BRAIDING MACHINE

Charles E. Nixon, 224 Edwards Ave., Sayville, N.Y. 11782

Filed Feb. 6, 1985, Ser. No. 698,811
Int. Cl.[4] D04C *3/18, 3/06, 3/42*
U.S. Cl. 87—48 9 Claims



1. For use in a multiple untwisted strand braiding machine having a movable carrier for carrying a spool of multiple untwisted strands in which the multiple strands are fed from the spool containing a winding of such multiple strands mounted upon the movable carrier, and after unwinding from the spool the multiple untwisted strands are deflected by stationary horizontal cam components for deflecting said multiple strands upwardly and downwardly, multiple untwisted strand guide apparatus comprising:
track means mounted on said movable carrier defining an elongated guide track extending upwardly and downwardly,
a very lightweight eyelet having an overall weight less than one-tenth of an ounce mounted in said elongated guide track and being freely movable along said guide track,
said eyelet having a smoothly rounded opening therethrough with smoothly rounded entry and exit,
said opening being adapted to have said multiple strands fed through it for allowing free upwardly and downwardly movement of said eyelet along said track means, and
said eyelet being spaced less than one inch from the nearest of said stationary horizontal cam components of the braiding machine in at least one position of the upward and downward movement of the eyelet for retaining said multiple untwisted strands grouped compactly with each other at said position less than one inch from the nearest of said stationary horizontal cam components,
whereby said multiple strands are protected from individual friction effects in their collective upward and downward movement and whereby said strands are retained closely grouped together by said eyelet near to said stationary horizontal cam components,
thereby greatly reducing the incidence of breakage of said strands during operation of the braiding machine.

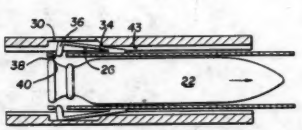
8. In a braiding machine, such as a Wardwell braider and the like, in which multiple untwisted strands are fed from each of a plurality of lower spools supported by moving mounting means upon a movable lower carrier and stationary deflector cam components serve to deflect the multiple untwisted strands during braiding action, apparatus for reducing the incidence of breakage of the strands in the braiding machine comprising:
a plurality of movable lightweight eyelet guides,
respective ones of said eyelet guides being movably mounted near the respective lower spools and having the multiple untwisted strands passing through the eyelet guide and being positioned near said deflector cams, said movable eyelet guides moving to within less than one inch from the nearest deflector cams for controlling the multiple strands being fed from each respective spool for keeping the multiple untwisted strands from the respective spool closely compactly associated near said deflector cams for reducing the incidence of snagging and breakage of individual strands.

4,616,554

EXTENDABLE TUBE FOR VERTICALLY DELIVERED WEAPONS

Thomas E. Spink, Ellicott City, and Frank C. Rushing, Columbia, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 13, 1984, Ser. No. 640,424
Int. Cl.[4] F41F *3/042, 3/052, 3/06*
U.S. Cl. 89—1.806 13 Claims



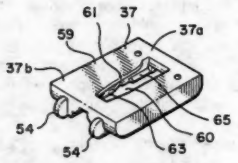
12. An extendable launch tube for a rocket comprising:
an inner tube for receiving the rocket concentrically in telescoped configuration;
an outer tube for receiving the inner tube and rocket concentrically in telescoped configuration;
releasable inner tube latch means coupled between the inner and outer tubes for securing the tubes in the telescoped configuration and releasing the inner tube from the outer tube in response to sufficient axial force on said inner tube whereby the inner and outer tubes become axially extended;
releasable rocket latch means coupled between the rocket and inner tube for securing them in the telescoped configuration and releasing the rocket from the inner tube in response to a selected axial extension of the inner and outer tubes.

4,616,555

MACHINE GUN FEED BLOCK

Charles W. Goff, 1267 W. 1875 North, Farmington, Utah 84025, and Charles W. Goff, Jr., 479 Laurelwood Dr., Kaysville, Utah 84037

Division of Ser. No. 580,366, Feb. 14, 1984, Pat. No. 4,473,394. This application Nov. 25, 1985, Ser. No. 801,238
Int. Cl.[4] F41D *10/24*
U.S. Cl. 89—33.02 2 Claims



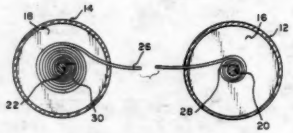
1. A cartridge feed block mounting arrangement for a weapon that employs a feed block for arrangement in a receiver portion thereof that includes an open stepped top, the feed block to serially position cartridge therein for pick-up and insertion into a barrel breech portion thereof comprising a seat for said cartridge feed block adjacent said receiver stepped portion, and a top strap for fitting in covering engagement over said receiver stepped portion, a forward end thereof to overhang one end of said seat to fit closely proximate to and across one end of said cartridge feed block when said top strap is installed in covering attitude over said receiver top; and forwardly projecting spaced apart ears that extend in the plane of said cartridge feed block means to fit within complementary slots formed in opposite sides of the barrel breech.

4,616,556

FLEXIBLE COMPRESSIBLE PISTON

Anna Meilman, 514 W. Cherry Hill Apartments, Cherry Hill, N.J. 08002; Sergey Meilman, Apartment E-5, 1865 Welsh Rd., Philadelphia, Pa. 19115, and Piotr Meilman, 514 W. Cherry Hill Apartments, Cherry Hill, N.J. 08002

Filed May 14, 1984, Ser. No. 610,124
Int. Cl.[4] F01B *19/00*
U.S. Cl. 92—48 2 Claims



1. A pump for selectively creating a vacuum or increasing pressure comprising:

first and second housings including first and second airtight chambers, respectively, therein;

an elongated flexible compressible piston;

an opening in each of said housings leading from the exterior of said housings to said chambers to allow said pistons to pass therethrough, each said opening having a configuration complementary to but smaller than the cross-sectional configuration of said piston whereby said piston is compressed as it passes through said opening and an airtight seal is created between the housing around said opening and said piston;

first and second rotatable axles mounted within said first and second chambers, respectively, one end of said piston being connected to said first axle and the other end of said piston being connected to said second axle, and

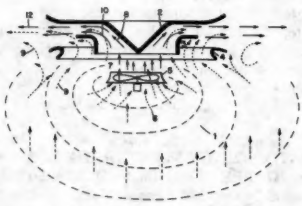
means extending to the exterior of said housings for rotating said axles for selectively drawing said flexible piston into or out of said chambers by spirally winding said piston onto or unwinding said piston from an axle, whereby when said flexible piston is drawn into one of said chambers, the pressure within that chamber increases and said flexible piston is simultaneously drawn out of the other of said chambers decreasing the pressure in said other chamber.

4,616,557

AIR MIXING DEVICE AND METHOD FOR PREVENTING INSECTS FROM FINDING HUMAN BEINGS

John A. Paoluccio, 3530 Kiernan Ave., Modesto, Calif. 95356

Continuation-in-part of Ser. No. 604,904, Apr. 27, 1984, abandoned. This application Jul. 10, 1985, Ser. No. 753,725
Int. Cl.[4] F24F *7/007*
U.S. Cl. 98—31.5 5 Claims



1. Apparatus for mixing air within a room, which comprises:

a hollow leg section having, at one axial location, a circumferentially extending outlet section, said leg section being disposed in substantially perpendicular relationship to said circumferentially extending outlet section;

a sleeve shaped first member disposed (1) in spaced relationship to said hollow leg section and (2) in spaced relationship from said circumferentially extending outlet section; and

a fan disposed in axial spaced relation from the lowest extremity of said leg section with an opening to ambient therebetween and oriented to push ambient air into said leg section and out said circumferentially extending outlet section; and said fan being dimensioned to urge primary air through said fan, said sleeve shaped first member including means to cause the primary air to draw secondary ambient air from the room intermediate said sleeve shaped first member and said circumferentially extending outlet section into the room.

4,616,558

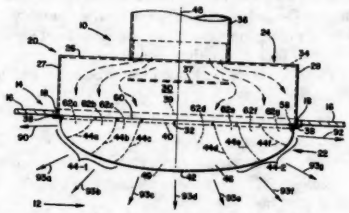
GASEOUS FLUID DISTRIBUTION DEVICES

Lewis C. Ball, Clinton, and Anthony F. Delia, Camillus, both of N.Y., assignors to Total Air, Inc., Mattydale, N.Y.

Filed Nov. 1, 1984, Ser. No. 667,144
Int. Cl.[4] F24F *13/075*
U.S. Cl. 98—40.11 16 Claims

13. A device for effecting a non-aspirated flow of air or other gaseous fluid into a room or other enclosure having a ceiling and determined vertical and horizontal dimensions with minimal turbulence, said device comprising: a perforate outlet member having a continuously curved cross-sectional configuration providing a horizontally oriented, curved bottom wall portion which transitions into curved, generally vertical side wall portions which are inwardly inclined at their upper edges and perforations through said side wall portions so located that a selected portion of the gaseous fluid flowing into said enclosure through said outlet member flows therefrom in paths which are generally parallel to said ceiling and perforations through said bottom and side wall portions which are so lo-

cated as to direct that gaseous fluid flowing therethrough into said enclosure in paths inclined downwardly at selected angles relative to said first-mentioned paths; end walls at the opposite ends of said perforate outlet member; and a plurality of downwardly extending vanes housed in said perforate outlet member for proportioning the flow of the fluid flowing through said outlet member among those segments of the perforate outlet member delineated by the lower edges of said vanes to thereby effect a particularly patterned flow of fluid into said enclosure.

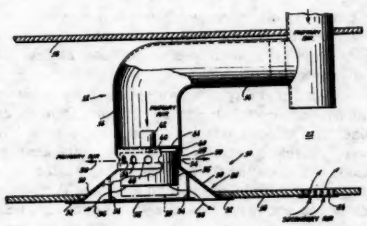


4,616,559

VARIABLE AIR DIFFUSER

Raymond S. Barlow, Tucson, Ariz., assignor to Pure Air Inc., Bethel, Conn.

Filed May 20, 1985, Ser. No. 736,174
Int. Cl.⁴ F24F *13/06*
U.S. Cl. 98—40.11 **18 Claims**



1. A variable air diffuser for discharging conditioned air (primary air) into an enclosure, comprising:

a hollow, open-ended housing having an axis and adapted to receive primary air from a primary air source, the housing being adapted for installation in an opening in a wall of the enclosure, the housing having an axially directed surface with apertures for providing fluid communication with a plenum outside the enclosure;

deflecting means mounted on the housing for blocking part of its open end and deflecting the primary air outwardly as it is discharged into the enclosure;

sleeve means movably mounted within the axially directed surface of the housing and coaxial thereto so as to be axially movable between a closed position in which the apertures of the housing are substantially closed by the sleeve means and an open position in which the apertures of the housing are substantially open; and

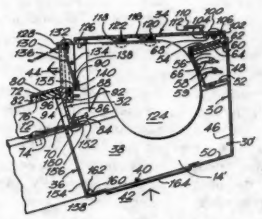
actuator means engageable with the sleeve means for selectively moving the sleeve means between the closed and open positions and to positions therebetween so as to cause a desired quantity of air to flow between the plenum and the air diffuser to alter the flow of the primary air discharged into the enclosure.

4,616,560

GREENHOUSE CONSTRUCTION PROVIDED WITH SPECIAL RIDGE FOR VENTILATION

Christopher Esposito, West Bay Shore, N.Y., assignor to Four Seasons Solar Products Corp., Farmingdale, N.Y.

Continuation of Ser. No. 565,989, Dec. 27, 1983, which is a continuation of Ser. No. 280,992, Jul. 6, 1981, Pat. No. 4,438,680, which is a continuation-in-part of Ser. No. 77,786, Sep. 21, 1979, Pat. No. 4,316,405. This application Apr. 2, 1985, Ser. No. 718,949
Int. Cl.⁴ A61G *9/24*
U.S. Cl. 98—42.02 **7 Claims**



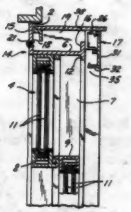
1. A greenhouse or solarium construction comprising a framework adapted for abutting a supporting structure, glazing on said framework and defining with said framework and supporting structure an enclosure, said framework including a plurality of glazing bars for supporting said glazing, said glazing bars including sloped upper extremities, said glazing including at least one sloped glazing section supported by said sloped under extremities of said glazing bars, said framework including ridge means abutting the supporting structure and receiving said sloped upper extremeties of said glazing bars, said sloped glazing section having an edge portion at least partly defining an opening located between the edge portion and said ridge means, pocket means for receiving said glazing section, and blower means in said opening at least partly obturating the same and coupled by said pocket means to said edge portion of said glazing section for the venting of said enclosure.

4,616,561

VENTED HEADING FOR WINDOW UNIT

James Giocastro, 53-11 73rd St., Maspeth, N.Y. 11378

Filed Nov. 18, 1985, Ser. No. 798,836
Int. Cl.⁴ E06B *7/02*
U.S. Cl. 98—97 **8 Claims**



1. A window unit adapted to be seated in a window opening of a wall of an apartment, the opening having a ceiling and side walls provided with a shoulder extending into the opening, the window unit including an outer frame having a top wall, a pair of side walls, a pair of double-hung glazed sashes encased in the frame between the side walls, and a shoulder depending from a rear end of the top wall defining a stop for a rearwardly disposed one of the sashes, wherein the improvement comprises a heading for the frame, the heading having a head panel

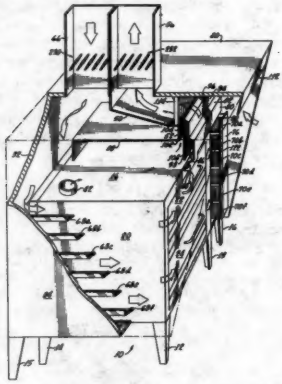
extending upwardly from a front end of the top wall, the head panel adapted to be seated at an upper end and sides thereof against the shoulder extending into the opening, a shoulder extending upwardly from the rear end of the top wall, a baffle panel extending in part upwardly relative to the rear end of the top wall and depending in part below the rear end of the top wall and the stop, the baffle panel defining a back to the heading in opposed spaced relation to the head panel, a clip fastened to the upwardly extending shoulder, the clip being engaged with and supporting the baffle panel in spaced relation to the rear end of the top wall, and the head panel having a plurality of vent holes communicating through the head panel with the space between the head panel and the baffle panel, the vent holes serving to allow air flow into the space between the head panel and the baffle panel, and the baffle panel serving to divert the air flow downwardly through the spacing between the baffle panel and the rear end of the top wall to the apartment side of the sashes, wherein the clip is of C-form comprising a back wall having a vertical slot, a fastener extending through the slot and fixing the clip to the upwardly extending shoulder of the top wall, the clip having an upper rearwardly extending arm engaged with an upper end of the baffle panel, the clip having a lower rearwardly extending arm engaged with the baffle panel, the back wall being vertically adjustable in its position relative to the fastener to seat the upper arm of the clip against the ceiling wall of the wall opening, and the upper arm of the clip being adapted to be fastened to the ceiling wall.

4,616,562

VENTILATION SYSTEM FOR PIZZA OVENS

Irvin R. Kuechler, 172 E. 27th St., San Bernardino, Calif. 92404

Filed Jun. 21, 1985, Ser. No. 747,649
Int. Cl.[4] F23J *11/00*; F24C *15/20*
U.S. Cl. 98—115.1 **13 Claims**



9. A ventilation and heat shield assembly for a cooking device having an opening on at least one substantially vertical side thereof that covers a major portion of such side, said ventilation and heat shield assembly comprising:

an insulating enclosure having an insulating top and side panels forming air flow passages arranged to flow cooling air along the top panel to the side panels and along the side panels to an end of such side panels,

intake fan means for blowing ventilating air from outside of a room in which the assembly is installed to the interior of said enclosure to flow along said top panel and along said side panels to said side panel ends,

means for mounting said intake fan means to draw in outside air

exhaust chamber means extending along an upper portion of said ventilating and heat shield assembly from one of said side panels to the other and having an exhaust port positioned adjacent to said top panel, said ventilation and heat shield assembly having a substantially vertically extending open area at a side thereof that extends from one of said side panel ends to the other,

exhaust fan means for exhausting air from said exhaust chamber, and

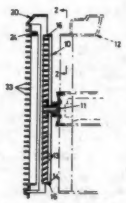
air curtain means included in said ventilation and heat shield assembly for causing air drawn into the assembly by said intake fan means to flow along the interior of said assembly and to flow in an air curtain across the open side of said assembly to said exhaust port to be exhausted by said exhaust fan means.

4,616,563

GRILLE CONTROL

Kevin I. Toohey, St. Marys, Australia, assignor to F.F. Seeley Nominees Pty. Ltd., Australia

Filed Jun. 19, 1985, Ser. No. 746,396
Claims priority, application Australia, Jun. 26, 1984, PG5688
Int. Cl.[4] F24F *13/10*
U.S. Cl. 98—40.3 **4 Claims**



1. Control means for arresting rotation of an air deflector grille which is carried for rotation in a frame, wherein said air deflector grille has a plurality of air deflector blades carried at their ends in an annular ring,

comprising a plurality of minor spaced projections extending outwardly a relatively small distance from the annular ring, and at least one major projection extending outwardly a relatively large distance from the annular ring, guide means on the frame, a slider bar guided for movement by the guide means, two abutment surfaces on the slider bar, the first of those abutment surfaces being engageable with any said projection upon movement of the slider bar in a first direction, and the second abutment surface being engageable only with the major projection upon movement of the slider bar in a second direction, either said engagement inhibiting said rotation.

4,616,564

MODULAR OFFSET LITHOGRAPHIC PRINTING TOWER

Terry N. Faddis, and Glen H. Ensminger, both of Emporia, Kans., assignors to Didde-Glaser, Inc., Emporia, Kans.

Continuation of Ser. No. 969,585, Dec. 14, 1978, abandoned. This application Oct. 6, 1980, Ser. No. 194,373
Int. Cl.[4] B41F *7/02*, *13/00*
U.S. Cl. 101—143 **4 Claims**

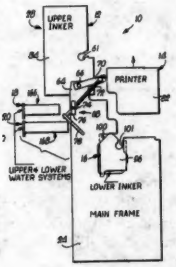
1. A web printing tower, comprising:

a pair of spaced apart main sidewalls each having an upper margin;

a modular printer section removably supported by said main sidewalls and including

a pair of spaced apart printer sidewalls separate from said main sidewalls, each of said printer sidewalls having a lower margin complemental with a portion of a corresponding main sidewall upper margin for complementally and abuttably engaging said upper margin portion,

whereby the printer section is situated generally atop and supported by said main sidewalls;
an elongated, cylindrical plate roller;
an elongated, cylindrical web-contacting blanket roller;
an elongated, cylinder; and
means for mounting said plate and blanket roller between said printer sidewalls in tangential contact with each other and for axial rotation of the plate and blanket rollers;
means for axially rotatably mounting said cylinder between said printer sidewalls and adjacent and generally below said blanket roller to define a web-receiving nip between the cylinder and blanket roller for a web traveling generally horizontally through said tower;
an inker section including spaced apart inker sidewalls separate from said main sidewalls and printer sidewalls, a single, elongated, cylindrical, axially rotatable inker form roller supported by said inker sidewalls, and means for continuously applying ink to the periphery of said inker form roller during printing operations of said tower;
means for mounting said inker section on said tower with said inker sidewalls abuttably engaging said main sidewalls and in a normal position above said printer section, with said single form roller in ink-transferring engagement with said plate roller, and for selective



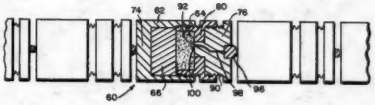
pivoting of the inker section about a generally horizontal axis from said normal position to a retracted printer section-clearing position permitting said printer section to be bodily moved upwardly out of said tower without obstruction from the inker section and while said inker section remains secured to said tower,
said upward movement of said printer section being generally transverse to the horizontal direction of travel of said web through said tower,
said single inker form roller being the sole inking roller in engagement with said plate roller when said inker section is in said normal position thereof;
means for rotating said rollers and said cylinder including respective spur gears drivingly coupled to said single form roller and plate roller and configured for meshed, driving interengagement when said inker section is in said normal position thereof;
the pitch diameter of the spur gear coupled to said inker form roller being substantially the same as the diameter of the inker form roller, and the pitch diameter of said spur gear coupled to said plate roller being substantially the same as the effective diameter of the plate roller,
whereby said tower can accommodate replacement printer sections having different diameter plate and blanket rollers without modification of said inker section.

4,616,565

MODULAR DETONATOR DEVICE

Robert E. Reinovsky, Albuquerque, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 20, 1984, Ser. No. 622,613
Int. Cl.[4] F42B *3/12*; F42C *19/12*
U.S. Cl. 102—202.7 **19 Claims**



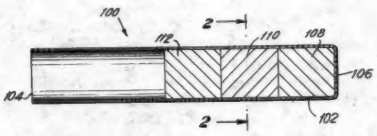
1. A detonator module, comprising:
a case having an outer terminus, for housing an explosive pellet;
a base having an outer terminus, for housing an explosive bridgewire;
a coupler for retaining an explosive charge in close proximity to said explosive bridgewire and to said explosive pellet; and
a means for completing an electrical path from said outer terminus of said case to said outer terminus of said base through said coupler and said bridgewire in a manner which allows use of said detonator module in a series of detonator modules.

4,616,566

SECONDARY HIGH EXPLOSIVE BOOSTER, AND METHOD OF MAKING AND METHOD OF USING SAME

Donald N. Yates, Jr., Katy, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Oct. 5, 1984, Ser. No. 658,266
Int. Cl.[4] F42B *3/00*
U.S. Cl. 102—318 **23 Claims**



1. An explosive booster, which comprises a secondary high explosive material of HMX having an average density of from 1.2 to 1.7 g./cc. such that the material is capable of receiving a detonation from another explosive material across a discontinuity interposed between the booster and said other explosive material to be detonated, capable of detonating in response to said received detonation, and capable of transmitting said responsive detonation to yet another secondary high explosive mass to effect detonation thereof.

4,616,567

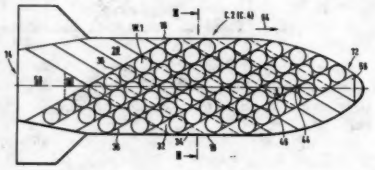
METHOD AND APPARATUS FOR COVERING A TARGET AREA WITH AMMUNITION

Rudolf Romer, Kaarst; Karl W. Bethmann, Moers; Christian Jaeneke, and Manfred Moll, both of Düsseldorf, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Division of Ser. No. 398,242, Jul. 14, 1982, Pat. No. 4,555,971. This application Jun. 20, 1985, Ser. No. 747,565
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1981, 3127674
Int. Cl.[4] F42B *25/16, 25/06*; F41F *5/02*
U.S. Cl. 102—489 **52 Claims**

1. In an apparatus for covering an area with ammunition

using a container which is moved toward the target area at a given height and which contains a plurality of active units, said apparatus including a container, a plurality of active units each having an essentially circular cross section, a number of linear receptacles in said container for simultaneously receiving a number of said active units in each said receptacle, with said receptacles being disposed in the interior of said container such that said receptacle extends along a respective straight line to an associated release opening in the lateral wall of said container when in flight, and with each said straight line (or its extension) forming a given acute angle with the longitudinal axis of said container, and means for causing the release of the active units from the receptacles; the improvement wherein:



said container is a gliding or cruise missile; the point of each said acute angle is disposed in front of the respective release opening when seen in the direction of flight; and said releasing means includes a booster charge which acts in the direction of flight to accelerate said missile.

4,616,568

PROJECTILES INTENDED TO BE FIRED BY A FIRE-ARM

Ladriere Serge, Avenue du Cap Roux, 06360 Eze sur Mer, France

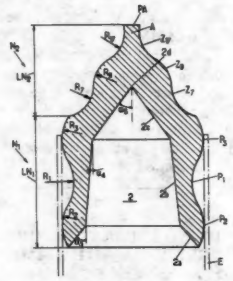
PCT No. PCT/FR83/00227, § 371 Date Jul. 20, 1984, § 102(e) Date Jul. 20, 1984, PCT Pub. No. WO84/02182, PCT Pub. Date Jun. 7, 1984

PCT Filed Nov. 24, 1983, Ser. No. 634,102

Claims priority, application France, Nov. 24, 1983, 82 19659

Int. Cl.[4] F42B *11/00*

U.S. Cl. 102—501 **8 Claims**



1. A projectile intended to be fired by a firearm comprising:

a rear portion of generally cylindrical configuration whose diameter determines the gauge of the projectile, and

a front portion of generally conical configuration, starting at said rear portion and ending in a front point,

wherein said front portion has, between said front point and said rear portion, a curved front hollow zone circumferentially located about said front portion and defined by a radius of curvature joined to said front point, and a curved rear hollow zone circumferentially located about said front portion and defined by a radius of curvature connected to said rear portion,

wherein these two said hollow zones are joined together by at least one curved bulge zone circumferentially located about said front portion and defined by at least one radius of curvature, and

wherein all of said zones connected together define a continuous surface which in cross-section shows a continuous curve of sinuous shape.

4,616,569

ARMOR PENETRATING PROJECTILE

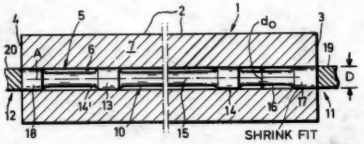
Patrick Montier, Bourges; Jean-Claude Sauvestre, St. Doulchard, both of France; Karl W. Bethmann, Moers, Fed. Rep. of Germany; Bernhard Bisping, Ratingen, Fed. Rep. of Germany, and Peter Wallow, Düsseldorf, Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Dusseldorf, Fed. Rep. of Germany and L'Etat Francais represente par le Delegue General pour l'Armement Bureau des Brevets et Inventions, Paris Armes, France

Filed Mar. 11, 1983, Ser. No. 474,284

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1982, 3208809

Int. Cl.[4] F42B *11/00*

U.S. Cl. 102—517 **3 Claims**



1. An armor-penetrating projectile comprising:

an outer substantially cylindrically tubular member of great length/diameter ratio and density, centered on an axis, and having an axially throughgoing bore defined by an inner surface; and

an axially elongated inner member of greater strength and elasticity than the outer member extending axially through the bore the full length of the outer member and having an outer surface in tight radial shrink-fit contact with the inner surface of the outer member at least a plurality of annular locations spaced along the axis,

said inner member is at least partially formed of a bundle of wires; and

wherein the inner member is formed with a plurality of axially spaced thickened regions having cylindrical outer surfaces engaging the inner bore surface.

4,616,570

POWER AND FREE CONVEYOR SYSTEMS

Clarence A. Dehne, Farmington Hills, Mich., assignor to Jervis B. Webb Company, Farmington Hills, Mich.

Continuation-in-part of Ser. No. 272,381, Jun. 10, 1981, abandoned. This application Oct. 14, 1983, Ser. No. 542,257

Int. Cl.[4] B61B *10/00*

U.S. Cl. 104—172 B **33 Claims**

1. In a conveyor system having a carrier track; carriers each including a driving trolley supported on the carrier track; forwarding and receiving power conveyors each comprising a power track spaced vertically from the carrier track, carrier propelling means mounted on the power track and including pusher members projecting toward the carrier track, an endless chain connected to the pusher members, and a drive unit for the endless chain; the driving trolley having a driving

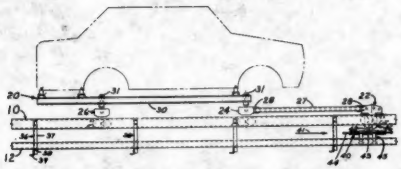
member movable between operable and non-operable positions with respect to the pusher members and biased to the operable position; and a transfer zone to which a carrier is propelled by a pusher member of the forwarding power conveyor and from which a carrier is propelled by a pusher member of the receiving power conveyor; the improvement wherein:

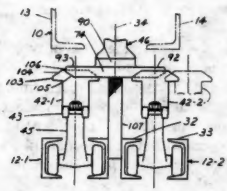
the driving member is formed with a driving dog having a driving face normally engageable by a pusher member in the operable position of the driving member;

the driving dog is provided with a pair of transversely extending wing portions each projecting to one side of the driving member and each having a continuation of the driving face;

a holdback dog is provided on the driving trolley, said holdback dog having a holdback face normally engageable by a pusher member, said wing portions of the driving dog project to each side of said holdback face, and said driving face of the driving dog includes a portion which projects toward the power track a distance greater than said holdback face;

the transfer zone has an entrance end, an exit end and includes a forwarding power track defining the path of travel of a forwarding pusher member and a receiving power track defining the path of travel of a receiving pusher member;





said forwarding and receiving power tracks between said entrance and exit ends have portions positioning the forwarding and receiving pusher members in a transversely spaced relation in which a forwarding pusher member is engageable with one portion of said driving face and a receiving pusher member is engageable with another portion of said driving face;

said driving dog including said wing portions thereof is provided with an anti-jam cam surface located forwardly of said driving face and adapted to move said driving member toward said non-operable position in response to overtaking engagement between said anti-jam cam surface and one of the forwarding and receiving pusher members; and

positioning means is provided in said transfer zone for relatively positioning said driving dog and said forwarding and receiving pusher members vertically such that overtaking and driving engagement between said driving dog and said forwarding and receiving pusher members is limited to said anti-jam cam surface for overtaking engagement and is limited to said outwardly projecting portion of said driving face for driving engagement whereby the drive unit of said forwarding power conveyor and the drive unit of said receiving power conveyor are independently and non-synchronously operable.

23. In a conveyor system having a carrier track, carriers each including a driving trolley supported on the carrier track, a power track mounted at a vertical spacing relative to the carrier track, carrier propelling means mounted on the power track and normally driven in a forward direction, the carrier propelling means including pusher members projecting toward the carrier track, the driving trolley having a driving member movable at said vertical spacing between operable and non-operable positions with respect to a pusher member and biased to the operable position, the improvement wherein;

the driving member is integrally formed with a driving dog and an actuating portion, the driving dog having a driving face engageable by a pusher member in the operable position of the driving member, and said actuating portion extends forwardly from the driving dog;

said driving dog includes a pair of wing portions each projecting transversely to one side of said actuating portion, and the driving face of said driving dog is provided on each of said pair of wing portions, the transverse extent of the wing portions being such that the driving face of said driving dog is engageable by forwarding and receiving pusher members of carrier propelling means mounted on a pair of power tracks arranged substantially at said vertical spacing and in transversely spaced relation at a transfer zone; and

an accumulating cam surface is provided on said actuating portion, each carrier being provided with a rearwardly extending actuator adapted to be engaged by said accumulating cam surface of a following carrier for stopping such following carrier by moving the driving member thereof to said non-operable position, said driving face of said driving dog in said non-operable position of said following carrier driving member being non-engageable by each of said forwarding and receiving pusher members at said transfer zone.

4,616,571

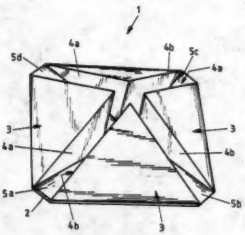
PANEL SECTION INTERCONNECTING MEMBER AND A SHELF STRUCTURE USING A PLURALITY OF THE PANEL SECTION INTERCONNECTING MEMBERS

Gerd Lange, Kapsweyer, Fed. Rep. of Germany, assignor to Willy Glaser, Baden, Switzerland

Filed May 22, 1984, Ser. No. 613,084

Int. Cl.[4] A47B *47/04*

U.S. Cl. 108—111 **14 Claims**



1. A panel section connector adapted to be used in the construction of shelf structures of shelf-like furniture, comprising:

a generally rectangular base member having a first surface, a second surface opposite to said first surface and four side edges;

first, second, third and fourth generally tetrahedrally shaped supporting members extending from said first surface of said base member and each including a first triangular side wall arranged approximately perpendicular to said first surface of said base member, a second triangular side wall aranged approximately perpendicular to said first surface of said base member and to said first side wall, and a third triangular top surface oblique to said first surface;

said first side wall of said first supporting member being approximately parallel to and spaced apart from said second side wall of said second supporting member to define therebetween a first receiving channel, said first side wall of said second supporting member being approximately parallel to and spaced apart said second side wall of said third supporting member to define therebetween a second receiving channel, said first side wall of said third supporting member being approximately parallel to and spaced apart from said second side wall of said fourth supporting member to define therebetween a third receiving channel, and said first side wall of said fourth supporting member being approximately parallel to and spaced apart from said second side wall of said first supporting member to define therebetween a fourth receiving channel, each of said receiving channels being adapted to receive a panel member of the shelf structure to be erected;

said first, second, third and fourth receiving channels together forming an approximately cross-shaped channel configuration having a pair of continuous open receiving channels extending completely across said first surface of said base member and parallel to a diagonal of said base member; and

said base member having a central opening therethrough adapted to receive mounting means for mounting said panel section connector to another structure.

4,616,572

BIOMASS INCINERATOR

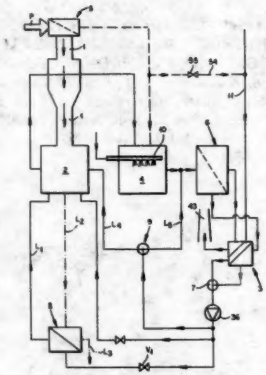
Franz Berthiller, A-3474 Winkl 2, Niederösterreich, Austria

Filed Oct. 17, 1984, Ser. No. 661,582

Claims priority, application Austria, Oct. 17, 1983, 3699/83

Int. Cl.[4] F23G *5/04*

U.S. Cl. 110—254 **23 Claims**



1. An incinerator for a biomass such as straw or wine-pressing residue, comprising:

a vertical biomass feed shaft;

an air/solids separator for separating pneumatically conveyed biomass from primary combustion air, communicating with one end of said shaft for delivering biomass freed from conveying air thereto;

means forming a combustion chamber communicating with the opposite end of said shaft for receiving biomass therefrom and burning said biomass in said combustion chamber with at least a portion of said primary air to form a flue gas;

means connected to said combustion chamber and forming a direct lateral opening from the combustion chamber into said shaft for passing said flue gas transversely through said shaft into contact with biomass therein, thereby preheating said biomass in said shaft and filtering said flue gas by a filter action of said biomass; and

means forming an afterburner chamber receiving said flue gas after it has traversed said shaft for afterburning combustible components in said flue gas, with air at least in part received from said separator.

4,616,573

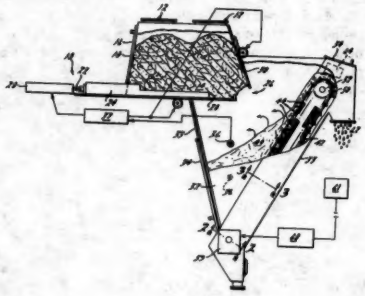
METERING FEEDER

Thomas A. Giaier, Ypsilanti; Neil H. Johnson, Grosse Ile; David C. Reschly, Monroe; Harold L. Knox, Grosse Ile, all of Mich., and Kim E. Spurlock, Toledo, Ohio, assignors to Detroit Stoker Company, Monroe, Mich.

Continuation of Ser. No. 558,376, Dec. 5, 1983, abandoned, which is a continuation-in-part of Ser. No. 490,657, May 2, 1983. This application Jun. 20, 1985, Ser. No. 747,372

Int. Cl.[4] F23K *3/00*

U.S. Cl. 110—327 **14 Claims**



1. An apparatus for delivering fuel for combustion, comprising:

a first hopper for containing a quantity of said fuel;

a second hopper disposed below said first hopper;

displacing means for causing a predetermined volume of fuel to drop from said first hopper into said second hopper; and

upwardly extending slat-type conveyor means at least partially disposed within said second hopper for removing fuel from said second hopper for combustion and having an upper portion;

said conveyor means having a closed course of cleats, a portion of said closed course facing interiorly into said second hopper for contacting the fuel therein, said second hopper and said upper portion of said conveyor defining a substantial unrestricted space extending substantially the entire length of said upper portion;

said conveyor means being sufficiently inclined and operable at a speed to promote back tumbling of said fuel from said cleats into said unrestricted space, thereby serving to decompact said fuel before it is delivered for combustion.

4,616,574

PROCESS FOR TREATING COMBUSTION SYSTEMS WITH PRESSURE-HYDRATED DOLOMITIC LIME

Jack Z. Abrams, and Robert M. Sherwin, both of San Rafael, Calif., assignors to Empire State Electric Energy Research Corp. (ESEERCO), New York, N.Y.

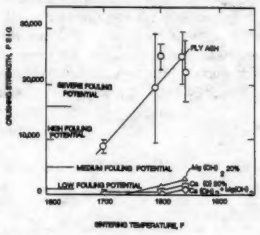
Filed May 25, 1984, Ser. No. 614,049

Int. Cl.[4] B01D *53/34*; C10L *10/04, 10/06*

U.S. Cl. 110—343 **19 Claims**

1. In a process for treating a combustion system wherein pressure-hydrated dolomitic lime additives are added to the system, the improvement comprising removing fly ash deposits by locally injecting said pressure-hydrated dolomitic lime additives to the situs of said fly ash deposits, at a temperature

above approximately 1800° F., in an amount and concentration sufficient to cause a weakened point in the deposits when they are formed, and so that at least 5% of the total deposit weight is comprised of said pressure-hydrated dolomitic lime additives



thereby facilitating subsequent removal of said deposits; operating said system to permit deposition of fly ash to occur; and subsequently removing said fly ash deposits by breaking off said deposits at their weakened points.

4,616,575

METHOD AND APPARATUS FOR THE HEAT TREATMENT OF FINE-GRAINED MATERIAL

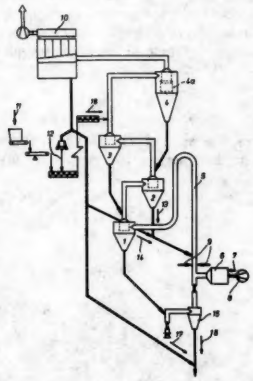
Hans-Gerd Schulte, Bergkamen, Fed. Rep. of Germany, assignor to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

Filed Sep. 16, 1985, Ser. No. 776,583

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1984, 3439129

Int. Cl.[4] F23J *15/00*

U.S. Cl. 110—345 **15 Claims**



1. In a method for heat treating fine-grained material, such as lime and dolomite, wherein:

(a) the material is preheated in a multi-stage cyclone preheater in heat exchange with exhaust gases from a calciner,

(b) then fired in the calciner,

(c) and then cooled in a cooling stage, and

(d) wherein dust is removed from the exhaust gases by a filter and such dust is returned to the apparatus,

the improvement comprising

(e) reducing the degree of efficiency of the last cyclone of the preheater preceding the filter in such manner that the finest-grained proportion of the material delivered to said last cyclone and lying below a selected grain size passes with the exhaust gas to the filter;

(f) delivering at least some of the filter dust directly to the calciner; and

(g) further decreasing the degree of efficiency of said last cyclone and increasing the quantity of filter dust delivered directly to the calciner to such an extent that said material neither cakes nor flows in batches.

4,616,576

COMBUSTION METHOD

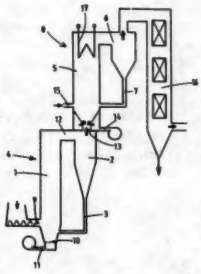
Folke Engström, Karhula; Bertel K. Hakulin, Helsinki, and Seppo K. Ruottu, Karhula, all of Finland, assignors to A. Ahlstrom Corporation, Noormarku, Finland

Filed May 29, 1985, Ser. No. 739,005

Claims priority, application Finland, Jun. 1, 1984, 842201

Int. Cl.[4] F23G *5/00*; F22B *1/00*

U.S. Cl. 110—345 **12 Claims**



1. A two-stage combustion method utilizing first and second circulating fluidizing bed systems, comprising the steps of:

supplying fuel to the first circulating fluidizing bed system, the fuel remaining fluidized during combustion thereof;

operating the first system under reducing conditions to produce flue gases with combustible solids therein;

separating the solids from the flue gases of the first system, recirculating the separated solids to the first system;

introducing the flue gases, after separation of solids therefrom, from the first system into the second circulating fluidizing bed system;

introducing oxygen containing gas into the second system to effect afterburning of the flue gases from the first system, and wherein in the second circulating fluidized bed system flue gases containing solids therein are produced; and

separating the solids from the second bed system flue gases, and returning the separated solids to the second circulating bed system.

4,616,577

SEED SOWING MACHINE WITH MONITORING SYSTEM

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Continuation of Ser. No. 4,540, Jan. 18, 1979, abandoned. This application Nov. 28, 1980, Ser. No. 211,186

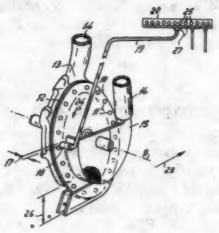
Claims priority, application Netherlands, Jan. 20, 1978, 7800713

Int. Cl.[4] A01C *5/00*

U.S. Cl. 111—1 **30 Claims**

1. Apparatus for monitoring material distributed by an agricultural machine, the apparatus comprising material transporting means, curved path defining means for the material including in said transporting means, means for separating said material into discrete units and spacing same an equal distance apart while such units are being moved along said path by said transporting means, an instrument mounted closely adjacent and entirely on one side of said path which includes means for producing an electric field and separately sensing the presence of each said discrete unit in at least a portion of said path while

directly supported by said transporting means by its proximity to said field producing means whereby said field is interrupted



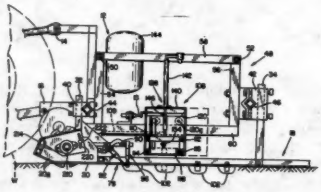
in reaction to each said unit, a display element connected to said instrument registering said presence in response to said field interruption.

4,616,578

AUTOMATIC METHOD AND APPARATUS FOR TRANSPLANTING CROPS

Gene B. Talbott, Box 173-D, Rte. 1, Banks, Oreg. 97106

Filed May 12, 1983, Ser. No. 493,992
Int. Cl.[4] A01C *11/00*
U.S. Cl. 111—2 **10 Claims**



1. A method for transplanting seedling plugs from seedling trays having cells aligned in separate rows into a plurality of spaced-apart crop rows in a field comprising:

orienting the seedling trays by a vehicle means over a field to be transplanted;

forming a plurality of laterally spaced-apart plant-receiving cavities in the ground aligned on the crop rows;

maintaining the seedling trays substantially stationary relative to the field at selected intervals during travel of the vehicle means;

engaging upper surfaces of the seedling plugs in different rows of the seedling trays and displacing them substantially vertically downwardly through and free from a cell while holding the seedling plugs by impaling means for insertion into the plant-receiving cavities; and

releasing the seedling plugs from the impaling means into associated plant-receiving cavities.

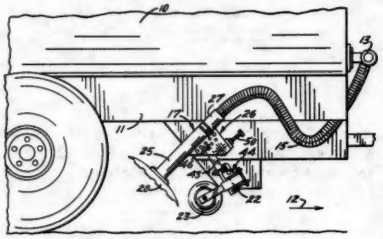
4,616,579

APPARATUS FOR INJECTING LIQUID MANURE INTO THE GROUND

Wayne J. Solt, 473 Rte. 73 South, Pearl City, Ill. 61062

Filed Apr. 1, 1985, Ser. No. 718,493
Int. Cl.[4] A01C *23/02*
U.S. Cl. 111—7 **7 Claims**

1. Apparatus for injecting liquid manure into the ground and for spreading the liquid manure in the ground, said apparatus being adapted for use with a forwardly traveling vehicle carrying a tank of liquid manure, said apparatus comprising upper and lower axially spaced and axially alined sleeves, means for mounting said sleeves non-rotatably on said vehicle in an upright position, an elongated pipe telescoped into and rotatable within said lower sleeve and having upper and lower ends projecting beyond the upper and lower ends of the lower sleeve, a collar located between and rotatable relative to said sleeves, said collar being connected to the upper end of said pipe and being engageable with the upper end of said lower sleeve to prevent said pipe from sliding downwardly within said lower sleeve, means for releasably coupling said collar to said pipe to permit said pipe to be withdrawn from said lower sleeve out of the lower end of the lower sleeve, a flexible hose communicating with said tank and having an outlet end portion telescoped into said upper sleeve, the outlet end portion of



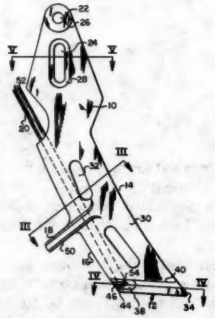
said hose having a reduced diameter lower end telescoped into and communicating with the upper end of said pipe to deliver liquid manure into the pipe, a generally circular disc mounted rigidly on the lower end portion of said pipe to rotate in unison with the pipe and to slice through the ground during forward travel of the vehicle, the underside of said disc being downwardly concave and defining a baffle around the lower end of the pipe, and the periphery of said disc being formed with angularly spaced notches whereby liquid manure delivered to said pipe is injected into the ground through the lower end of said pipe and is spread into the ground by the rotary disc while flowing radially out of the notches in the periphery of the disc.

4,616,580

ANHYDROUS KNIFE

Alan R. Moore, Parma, and Nicholas M. Januszewski, Albion, both of Mich., assignors to Hayes-Albion Corporation, Jackson, Mich.

Filed Jan. 23, 1985, Ser. No. 694,033
Int. Cl.[4] A01B *17/00*
U.S. Cl. 111—7 **8 Claims**



1. An anhydrous knife characterized by its long life and resistance to damage comprising, in combination, an elongated body of homogeneous cast metal having a width defined by lateral sides, a lower toe end, an upper attachment end, an intermediate region, a forward edge and a trailing edge, a

dispensing tube within said body extending from adjacent said upper end through said intermediate region to said lower toe end having an accessible upper supply end and a lower dispensing end, said dispensing tube being integrally cast within the configuration of said body and surrounded and protected by the material of said body from adjacent said upper attachment end to said lower toe end, an opening defined in said tube lower end adjacent said body toe end permitting dispensing adjacent said toe end, said lower body toe end being of a homogeneous enlarged, elongated configuration defining a mass of cast sacrificial metal to extend the wear life of said body having a pointed apex defining a portion of said body forward edge and side portions laterally extending beyond the projection of said body lateral sides.

4,616,581

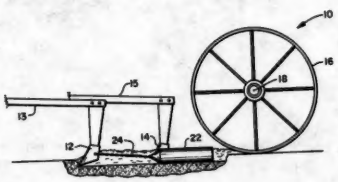
PLANTING APPARATUS

Glen E. Brothers, Rte. 1, Box 80 C, Dix, Nebr. 69133

Continuation of Ser. No. 239,059, Feb. 27, 1981, abandoned. This application Apr. 29, 1985, Ser. No. 728,183

Int. Cl.[4] A01C *5/00*

U.S. Cl. 111—85 **11 Claims**



1. Apparatus for seeding, which comprises:

a plurality of means for opening a furrow disposed in a rank at uniform intervals;

a plurality of press wheels mounted for rotation, each of said press wheels being disposed in aligned relationship with one of said means for opening a furrow;

a plurality of cylindrical members; and

means for attaching each of said plurality of cylindrical members to one of said means for opening a furrow, said means for attaching consisting solely of a chain fixed to each of said means for opening a furrow and fixed to respective ones of said plurality of cylindrical members, each cylindrical member being free to extend toward an associated press wheel disposed in aligned relationship with said means for opening a furrow disposed in said rank from which said chain is mounted, each chain member extending generally rectilinearly during normal operation, each of said chains being dimensioned to allow the cylindrical member fixed thereto to extend so that an extremity of the member is within one inch of said associated press wheel.

4,616,582

WORK CLAMP FOR BUTTONHOLE SEWING MACHINES

Walter Hager, Kaiserslautern, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

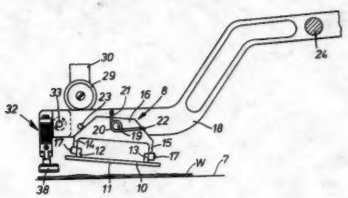
Filed Mar. 13, 1985, Ser. No. 711,397

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1984, 3409942

Int. Cl.[4] D05B *3/06*

U.S. Cl. 112—76 **7 Claims**

1. A work clamp for a buttonhole sewing machine having a work support plate with an area where a buttonhole is to be sewn, the buttonhole having a longitudinal axis and the sewing machine having a direction of work movement, comprising a carrying lever pivotally mounted at a pivot axis on the sewing machine and having an end which can be raised and lowered over the support plate, a clamping frame pivotally mounted on said carrying lever about an axis parallel to the pivot axis of said lever and at said end of said lever which can be raised and lowered, said clamping frame having a clamping surface for holding a work against the support plate adjacent the area where a buttonhole is sewn, spring means engaged with said clamping frame for biasing said clamping surface into an acute angle with respect to the support plate, said clamping frame being pivotally mounted on said carrying lever so that said clamping surface is movable parallel to the longitudinal axis of



the buttonhole, and hold-down means having a presser plate, further spring means engaged with said presser plate for biasing said presser plate in a direction toward the support plate for clamping a work against the support plate, said presser plate being carried by said lever at a location offset in a direction of work movement so that, when said lever is lowered, said presser plate first engages the support plate before said clamping frame and while said clamping surface is disposed at the acute angle with respect to the support plate.

4,616,583

THREAD TIGHTENING CONTROL APPARATUS OF AUTOMATIC SEWING MACHINE

Kunio Takano, Tokyo, and Masanori Nukushina, Kanagawa, both of Japan, assignors to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan

PCT No. PCT/JP84/00622, § 371 Date Aug. 7, 1985, § 102(e) Date Aug. 7, 1985, PCT Pub. No. WO85/03093, PCT Pub. Date Jul. 18, 1985

PCT Filed Dec. 27, 1984, Ser. No. 767,584

Claims priority, application Japan, Dec. 29, 1983, 58-251446

Int. Cl.[4] D05B *21/00, 47/04*

U.S. Cl. 112—121.12 **3 Claims**

1. A thread tightening control apparatus of an automatic sewing machine, comprising:

a needle rod having a needle secured to a lower end thereof and movable up and down in operative association with a spindle;

a fabric holding body for holding a fabric at a lower end thereof and movable along a horizontal direction relative to the needle rod;

drive means coupled to the fabric holding body and operated by electrical drive pulses for driving the fabric holding body in a horizontal direction with respect to a needle descent point;

memory means for storing feed data which determine the amount of movement of the fabric holding body for each and every seam;

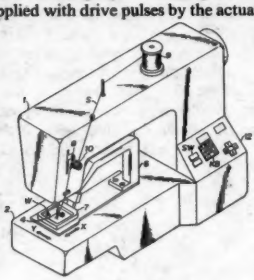
pulse generating means synchronized to the spindle for generating pulse signals of a constant period and of a number proportional to the rotational speed of the spindle;

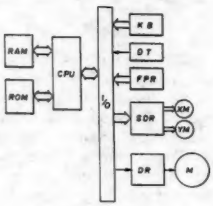
actuating means for supplying the drive means with drive pulses in a period during which the needle is clear of the fabric in synchronism with said pulse signals and on the basis of the feed data in the memory means;

setting means capable of generating a plurality of setting signals of different timings at which the drive pulses are to be supplied to the drive means in dependence upon fabric thickness; and

shifting means operable in association with the setting sig-

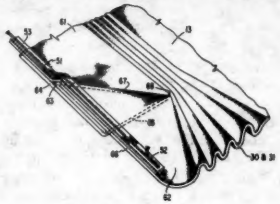
nals for moving a period during which the drive means is supplied with drive pulses by the actuating means forward

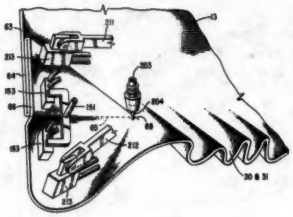




or backward with respect to a predetermined rotational angle of the spindle.

machine stitch forming instrumentalities and for imparting translatory movement to said fabric panel relatively to said





sewing machine and parallel to the line of stitch formation of said sewing machine.

4,616,584

METHOD AND APPARATUS FOR SEWING MITERED CORNERS OF BOX TYPE ARTICLES

Artin G. Vartoukian, Roselle Park, and Robert P. Haggerty, Elizabeth, both of N.J., assignors to The Singer Company, Stamford, Conn.

Division of Ser. No. 702,975, Feb. 19, 1985, Pat. No. 4,594,956. This application Mar. 24, 1986, Ser. No. 842,974

Int. Cl.[4] D05B *21/00*

U.S. Cl. 112—121.15 **8 Claims**

1. Apparatus for forming and securing in a flat square corner of a fabric panel a mitered corner for a fitted sheet or the like, said apparatus including a sewing machine having stitch forming instrumentalities adapted to produce a straight line of stitches, a fabric manipulating assembly including a fabric folding means effective to position a corner of said fabric panel superposed and flat upon one end of said fabric panel which extends from said corner, a fabric shifting means effective to transport a portion of the other edge of said fabric panel which extends from said corner superposed flat upon and in alignment with said one edge of said fabric panel, means for maintaining said fabric panel edges superposed, and means for presenting said maintained superposed fabric panel edges to said sewing

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4,616,585

DEVICE PROVIDING FOR THREE SEWING MACHINE NEEDLE STROKES

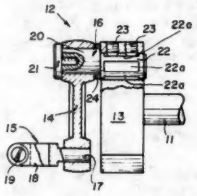
Ulderico Marcandalli, Milan, Italy, assignor to Rockwell-Rimoldi S.p.A., Italy

Filed Nov. 1, 1985, Ser. No. 793,824

Claims priority, application Italy, May 27, 1985, 20910 A/85

Int. Cl.[4] D05B *55/14*

U.S. Cl. 112—221 **1 Claim**



1. In a double chain stitch and/or overlock sewing machine having a main shaft connected to a motor, a secondary shaft rotatably driven by the main shaft, a reciprocating needle bar disposed perpendicularly to the secondary shaft, a needle bar actuating device mounted on the secondary shaft having a crank provided with a crank pin, a link mounted on the crank pin to connect said crank to said needle bar for actuating the latter to move in reciprocating motion, the crank pin comprising first and second pins which are arranged in succession and mutually offset and parallel wherein said first pin is rotatably engaged with said link and said second pin is mounted on said crank and is formed with three angularly spaced flat surfaces, each of said three angularly spaced flat surfaces being fixable in one predetermined position with respect to said crank to reciprocate said needle bar in a predetermined different stroke length.

4,616,586

UPPER FEEDING DEVICE OF A SEWING MACHINE

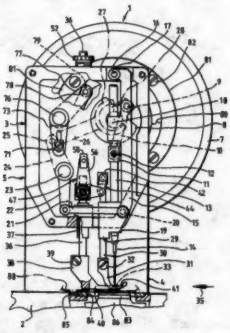
Hans Scholl, Oerlinghausen-Lipperreihe, Fed. Rep. of Germany, assignor to Kochs Adler, AG, Fed. Rep. of Germany

Filed Jun. 7, 1985, Ser. No. 742,695

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1984, 3423843

Int. Cl.[4] D05B *27/04*

U.S. Cl. 112—320 13 Claims



1. An upper feeding device of a sewing machine comprising a feeding presser foot, a holding presser foot alternatingly cooperating with said feeding presser foot to which is imparted by means of an oscillating means and an angle lever coupled thereto via a jogging mechanism an up and down movement extending perpendicular to a throat plate of the sewing machine, said jogging mechanism being provided with a movable slider and said movable slider being coupled to said angle lever via a slide guide which is positioned parallel to the direction of movement of the presser foot.

4,616,587

LOCKING MECHANISM FOR A SELF-DUMPING BARGE

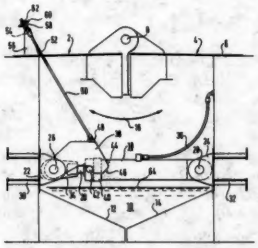
Isidor Weiss, Deggendorf, Fed. Rep. of Germany, assignor to Deggendorfer Werft und Eisenbau Gesellschaft m.b.H., Fed. Rep. of Germany

Filed Jun. 28, 1985, Ser. No. 750,743

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1984, 3424454

Int. Cl.[4] B63B *35/30*

U.S. Cl. 114—29 13 Claims



1. An actuating and locking mechanism for a self-dumping barge having two parts which are movable with respect to each other between a closed and an open position for closing and opening a hold, comprising:

a cylinder connected to one of the two parts;

a piston rod slidably mounted to said cylinder and having an outer end spaced from the one part of the barge;

a transverse bolt connected to said cylinder;

a hook support connected to the other of the two parts, said outer end of said rod being connected to said hook support for pivoting motion;

a hook pivotally mounted to said hook support for movement into engagement with said transverse bolt when said two parts are in their closed position for locking the two parts together, and for movement out of engagement with said transverse bolt for permitting said two parts to move under the influence of said cylinder and piston to their open position; and

said cylinder having an outer end spaced from the one part of the barge and into which said piston rod extends, said transverse bolt being connected to said cylinder at said outer end thereof.

4,616,588

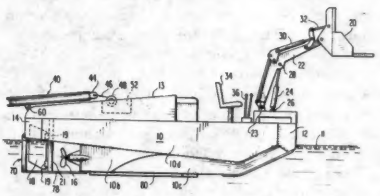
WATER CRAFT AND METHOD FOR REMOVING WEEDS AND POLLUTANTS FROM NAVIGABLE WATERS

Mary J. Caddick, 74 Winifred Lane, Aughton, Ormskirk, Lancs, United Kingdom L39 5DL

Filed Jan. 9, 1985, Ser. No. 689,940

Int. Cl.[4] B63H *25/06*

U.S. Cl. 114—162 15 Claims



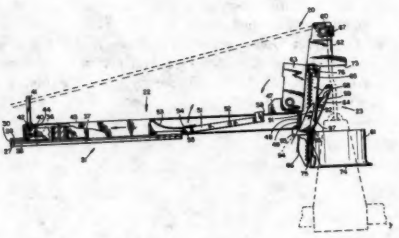
1. A navigable water craft including a hull and having a stern area including a stern and a rudder, a weed removal tool for removing weeds and other marine vegetation, said tool being located at the stern area, means on the craft for lowering the tool into the water at the stern for dragging the tool along a water bed as the craft is navigated through water and for raising the tool onto the stern area, means fixed to the stern and located behind the rudder and extending substantially to the depth of the rudder for protecting the rudder from engagement by the tool, buoyancy means at the stern area for compensating for the weight of the means for protecting the rudder, means including an engine for driving the craft, and a cooling tank having a closed coolant circuit for cooling the engine, said cooling tank being located on the bottom of the hull to be submerged in the water to contact the same when the craft is in use, said hull including a generally flat bottom wall, said cooling tank including a bottom wall spaced from and fixed to the flat bottom wall of the hull to enclose a space sealed from the sea water, said cooling tank further including means fixed to and between the bottom wall of the hull and the bottom wall of the tank forming a continuous serpentine flow path for coolant within said space sealed from the sea water, said bottom wall of the tank having an unobstructed external surface exposed directly to the sea water to promote heat exchange between the sea water and coolant within the tank.

4,616,589

ANCHOR RETRIEVAL MECHANISM

Truman W. Adams, Indianapolis, Ind., assignor to Anchors, Inc., Indianapolis, Ind.

Filed Apr. 6, 1984, Ser. No. 597,361
Int. Cl.[4] B63B *21/22*
U.S. Cl. 114—210 19 Claims



19. An anchor and anchor retriever assembly for deploying an anchor from a boat into the water and retrieving the anchor from the water, said assembly including a releasable anchor having a central body portion, releasable outwardly extending arms and a central rod, and an anchor cable secured to said central rod, wherein the improvement comprises:

support means adapted for attachment of the anchor retriever to a portion of a boat;

a movable anchor carriage slidably received by said support means and movable between an anchor-deployed orientation and an anchor-stowed orientation, said movable anchor carriage including a pivotal anchor retention assembly which is oriented in a first position when said movable anchor carriage is in said anchor-deployed orientation and in a second position which is substantially perpendicular to said first position when said movable anchor carriage is in said anchor-stowed orientation, said anchor retention assembly includes:

anchor holder means adapted for the anchor cable to pass therethrough;

latch means assembled to said anchor holder means and adapted to interlock with said movable carriage when said anchor retention assembly is in said anchor-deployed orientation; and,

pivot attachment means assembled between said movable carriage and said anchor holder means and adapted to allow said anchor holder means to pivot from a first orientation when said anchor retention assembly is in said anchor-deployed orientation to a second orientation which is substantially perpendicular to said first orientation, said second orientation corresponding to said anchor-stowed orientation; and

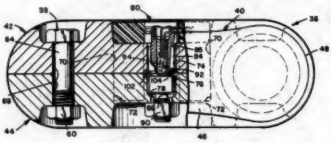
said support means including an attachment plate designed and arranged for directly attaching to the boat and assembled thereto a guide plate providing a pair of oppositely disposed, longitudinally extending first guide members and said movable anchor carriage having a pair of oppositely disposed, longitudinally extending second guide members, said first and second guide members being cooperatively received, one within the other, for providing a retained sliding motion of said movable anchor carriage relative to said guide plate.

4,616,590

ACOUSTICAL MOORING RELEASE SYSTEM

Rocco D. Albertini, Concordville, Pa.; Ralph E. Clements, Katy, Tex., and Thomas V. Grzeczkowski, Ridley Park, Pa., assignors to Baldt Incorporated, Chester, Pa.

Filed May 7, 1984, Ser. No. 607,760
Int. Cl.[4] F16G *15/04*
U.S. Cl. 114—230 27 Claims



1. A separable link for use with a moorable vessel, such as a semi-submersible drilling rig, having a plurality of chain lockers, a plurality of anchor windlass assemblies and a plurality of fairlead assemblies, a plurality of lengths of chain each having a multiplicity of interconnected links configured to move from a chain locker in cooperative relation through an associated anchor windlass assembly and an associated fairlead assembly, an anchor for each length of chain, and means connecting each anchor to the end of the associated length of chain outboard of the associated fairlead assembly so as to engage with the water bottom, the separable link comprising:

a plurality of removably interconnected parts operable when interconnected to interengage with the adjacent links of the associated length of chain;

said separable link being shaped to be moved from a position inboard of the associated anchor windlass and fairlead assemblies to an operative position outboard thereof;

an acoustical receiver and explosive assembly operable to be disposed in operable relation with said parts within the confines of said separable link so as to enable the separable link with said assembly in said operable relation therewith to be moved from said inboard position into said operative position;

said assembly in said operative relation including (1) retaining means retaining said parts together, (2) acoustical signal receiver means and (3) explosive means, including an explosive, operable when said acoustical receiver means receives a predetermined acoustical signal after the separable link has been moved into said operative position to release the retention of said retaining means and separate the parts of said separable link.

4,616,591

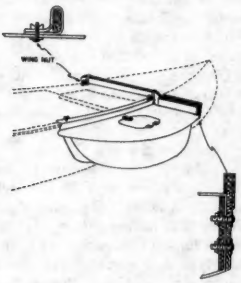
FLOATATION, SPLASHLESS CANOE MOTOR MOUNT

John M. Minor, 9340 Lee Smith Dr., Juneau, Ak. 99801

Filed Apr. 18, 1985, Ser. No. 724,536
Int. Cl.[4] B63B *35/71*
U.S. Cl. 114—347 1 Claim

1. A floatation, splashless motor mount designed to be fastened to the side of a canoe by means of wing nuts and bolts through the metal reinforcing bands of the mount and the canoe gunwales, said mount comprising a transom board extending across both gunwales and fastened to both gunwales and a streamlined floatation body providing a relatively smooth transition from the canoe side and being fastened to the near side gunwale through a lip overhanging the gunwale and fastened to the transom board by means of bolts through the transom board and the floatation body; the floatation body having an access door to its hollow interior to service the transom bolts and to allow storage of light tackle and floatation body also having an overhanging rim on the outside top perim-

eter to deflect waves and splashes; the transom board having sufficient free margin protruding vertically from the attachment point with the floatation body to accomodate the clamping devices of typical portable outboard motors.

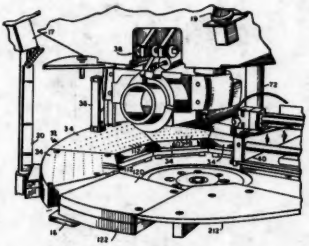


4,616,592

RECEIVING BELT BLOWBACK ARRANGEMENT

Ralph E. Karcher, Jr., Magnolia, and Blandford W. Greene, Manchester, both of Mass., assignors to USM Corporation, Farmington, Conn.

Filed May 25, 1984, Ser. No. 614,059
Int. Cl.[4] B05C 1/02
U.S. Cl. 118—202 4 Claims



1. A powder deposition machine for fusing powdered material comprising:

conveyor means including a conveyor belt,

a first work station including means for depositing powdered material on said conveyor belt,

a second work station including heater means for fusing material deposited on said conveyor belt, said heater means including

surface means for supporting said conveyor belt,

said surface means having a plurality of orifices,

means for intermittently advancing said conveyor belt to advance deposited powdered material at said first station to said second station,

means for supplying pressurized fluid to said orifices to be expelled from said surface means to define a fluid bearing between said surface means and said conveyor belt,

means for creating a vacuum at said orifices whereby said conveyor belt will be forcefully brought into contact with said surface means,

means for conjointly actuating said supplying means and deactuating said vacuum creating means when said conveyor belt is being advance, and

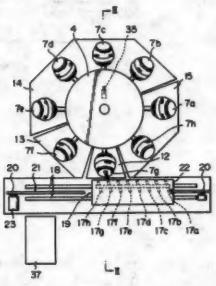
means for conjointly actuating said vacuum creating means and deactuating said supply mean when said conveyor belt is not being advanced.

4,616,593

PAINT SUPPLY APPARATUS FOR ROTARY PAINTING MACHINE

Kaoru Kawamura, and Yuichi Iwaki, both of Toyama, Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Sep. 12, 1985, Ser. No. 775,235
Claims priority, application Japan, Sep. 19, 1984, 59-196137
Int. Cl.[4] B05B 7/02
U.S. Cl. 118—303 2 Claims



1. A paint supply apparatus for a rotary painting machine having a revolvable turntable, a plurality of angularly spaced, radially extending barrels made of wire mesh mounted on a circumferential portion of said turntable and having respective axes of rotation, each of said barrels being receptive of a batch of parts, and a painting station, a setting station, a baking and drying station and a cooling station successively disposed around said turntable, wherein a batch of parts introduced into said barrels is painted by passing each of said barrels through each of said stations while each barrel is being rotated about its axis of rotation as said turntable is intermittently revolved by a single pitch equivalent to the angular spacing between mutually adjacent ones of said barrels, said paint supply apparatus comprising paint spray guns the number whereof is equivalent to the number of said barrels, a support frame on which said paint spray guns are supported in spaced side-by-side relation, and means for intermittently moving said support frame at said painting station by a single pitch equivalent to the spacing between mutually adjacent ones of said paint spray guns in synchronism with incremental revolution of said barrels, each of said barrels being supplied with a predetermined paint sprayed from one of said paint spray guns.

4,616,594

PAINTING BOOTH

Joji Itho, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

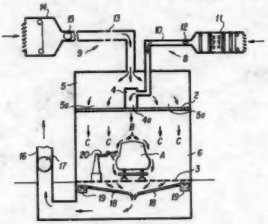
Continuation of Ser. No. 505,467, Jun. 17, 1983, abandoned.
This application Nov. 7, 1984, Ser. No. 669,057
Int. Cl.[4] B05B 13/02, 15/12
U.S. Cl. 118—326 10 Claims

1. A painting booth for painting an object, comprising:

a painting booth having a filter and a drainboard positioned therein and forming a first air supply chamber above said object to be painted and extending in a direction in which said object to be painted is conveyed, said first air supply chamber having an air-supplying opening facing said filter and having a width which is smaller than that of the object to be painted; a second air supply chamber in which said first air supply chamber is disposed and which is defined by said filter and extending in a direction in which said object to be painted is conveyed; a painting chamber defined by said filter and said drainboard; and a paint mist separating chamber defined by said drainboard in said painting booth;

a painting device positioned in said painting chamber;

a first air supply system comprising said first air supply chamber operatively connected with said painting booth and including means for supplying air which flows through said opening of said first air supply chamber to strike said object and to flow down along opposite sides of said object, said object being centrally located in the painting booth, and means for controlling the temperature



and humidity of the air to be supplied into a zone in said painting chamber through which said object to be painted is conveyed; and

a second air supply system operatively connected with said painting booth and including means for supplying air without a controlled temperature and humidity into said painting chamber exclusive of said zone through which said object is conveyed.

4,616,595

DEVICE FOR DEPOSITING A LAYER OF SILICON ON A CARBON TAPE

Christian Belouet, Sceaux, France, assignor to Compagnie Generale d'Electricite and Societe Nationale Elf Aquitaine, both of, France

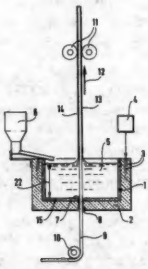
PCT No. PCT/FR85/00054, § 371 Date Jan. 11, 1985, § 102(e) Date Jan. 11, 1985, PCT Pub. No. WO85/04196, PCT Pub. Date Sep. 26, 1985

PCT Filed Mar. 15, 1985, Ser. No. 800,636

Claims priority, application France, Mar. 16, 1984, 84 04074

Int. Cl.⁴ B05C *3/172*

U.S. Cl. 118—405 **2 Claims**



1. A device for depositing a layer of silicon on a carbon tape, the device comprising:

a receptacle provided with a horizontal bottom having a slot passing therethrough, the horizontal profile of the slot comprising two parallel and facing straight segments, said segments delimiting a rectangular area whose length corresponds to the segments, the tape passing through the slot in such a manner that the width of the tape is parallel to the segments,

means for disposing a bath of liquid silicon in the receptacle, and

means for vertically drawing the tape upwardly and lengthwise in such a manner as to deposit said layer, the width of the said rectangular area being sufficiently small for the silicon meniscus connecting the tape to the walls of the slot to be stable; characterized in that

the wall (**23, 24**) of the slot (**7**) flares (**33**) outwardly at the bottom face (**16**) of the bottom (**15**);

the length of the segments (**23, 24**) is equal to the width of the tape (**9**); and

the horizontal profile of the slot (**7**) further includes two circular curves (**26, 27**) delimiting two circular areas (**28, 29**) disposed at respective ends of the said rectangular area (**25**), each of said circular areas being centered on the longitudinal axis (**32**) of the rectangular area (**25**), the circular curves (**26, 27**) connecting with the ends of the segments (**23, 24**) in such a manner that the circular areas (**28, 29**) are in communication with the rectangular area (**25**), the diameter (**34**) of the circular areas (**28, 29**) being greater than the width (**19**) of the said rectangular area (**25**) and less than a predetermined limit value.

4,616,596

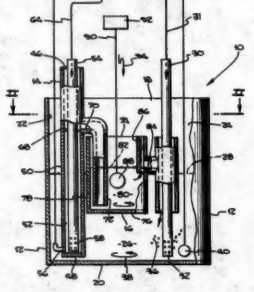
ELECTROLESS PLATING APPARATUS

Carlyle L. Helber, Jr., Fountain Valley, and Frank A. Ludwig, Rancho Palos Verdes, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 21, 1985, Ser. No. 789,867

Int. Cl.⁴ B05C *11/10, 3/05*

U.S. Cl. 118—603 **11 Claims**



1. An apparatus adapted for use in electroless plating wherein a metal is autocatalytically plated from an electroless plating solution onto a plating surface by a process in which the activity of the plating solution is regulated by the amount of a first predetermined gas dissolved in the plating solution, which comprises:

(a) an outer container having a top, a bottom, and side walls defining a reservoir for plating solution rich in said first predetermined gas;

(b) first sparger means for introducing said first gas into said reservoir in a sufficient amount to provide a predetermined level of said first gas in the electroless plating solution in said reservoir, to produce a stabilized plating solution;

(c) a flux container located inside said outer container, said flux container having a top, a bottom, and side walls defining a flux zone which is separate from said reservoir;

(d) means for transferring stabilized plating solution from said reservoir to said flux zone;

(e) second sparger means associated with said flux zone for

introducing a second predetermined gas into said flux zone to reduce the amount of said first gas in said stabilized plating solution to a level sufficient to produce active electroless plating solution;

(f) a plating vessel located inside said outer container, said plating vessel having a top, a bottom, and side walls defining a plating zone which is separate from said reservoir;

(g) means for transferring active electroless plating solution from said flux zone to said plating zone for plating of metal onto the plating surface which is placed within said plating zone; and

(h) means for transferring active electroless plating solution from said plating zone to said reservoir.

4,616,597

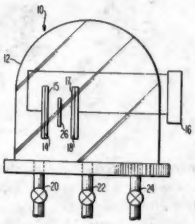
APPARATUS FOR MAKING A PLASMA COATING

Grzegorz Kaganowicz, Belle Mead, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 31, 1984, Ser. No. 666,838

Int. Cl.[4] H01L *21/316*

U.S. Cl. 118—723 **7 Claims**



1. In a radio frequency (RF) glow discharge apparatus for deposition of a film of a first material on a substrate, said apparatus having a capacitively coupled electrode, spaced apart from said substrate, which electrode is capable of transferring the power from an RF power source to a gas plasma within said apparatus,

the improvement comprising;

a plate of a second material affixed to that surface of the electrode which is coupled with the plasma, being of sufficient thickness to render negligible any changes in the potential between the electrode and the substrate to be coated caused by deposition onto said electrode.

4,616,598

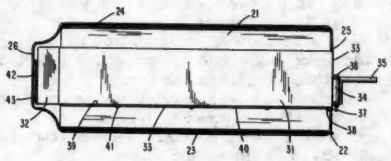
EASY CLEAN PET LITTER BOX

Edward W. Burniski, 124 Prospect St., Wilkes-Barre, Pa. 18702, and Michael A. Jannuzzi, 1000 Roosevelt St., Edwardsville, Pa. 18704

Filed Dec. 10, 1984, Ser. No. 679,922

Int. Cl.[4] A01K *23/00*

U.S. Cl. 119—1 **22 Claims**



1. An easy to clean pet litter box that saves reusable pet litter, comprising:

a generally upright box composed of four sides and open at its top and bottom ends;

a generally flat cover, sized and shaped to be attached to said box at either said top end or said bottom end thereof;

a tray, sized and shaped to snugly fit said box within said four sides, open at its top and provided with a bottom containing perforations of predetermined shape, size and distribution;

a perforated sheet, whose perforations match said perforations of predetermined shape, size and distribution in said tray bottom, making substantial sliding contact with and movably attached to the outside of said tray bottom; and

control means for controllably moving said perforated sheet with respect to said perforated tray bottom so as to selectively obtain substantial congruence or substantial mismatch between said matching perforation distributions therein.

4,616,599

COOLING ARRANGEMENT FOR WATER-COOLED INTERNAL COMBUSTION ENGINE

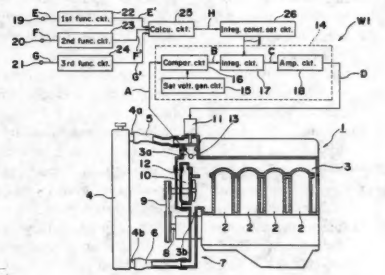
Takafumi Taguchi; Masahiro Nakano; Nobuo Hiramoto, all of Hiroshima, and Hideki Tominaga, Higashihiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Feb. 5, 1985, Ser. No. 698,531

Claims priority, application Japan, Feb. 9, 1984, 59-23699; Feb. 9, 1984, 59-23700; Feb. 9, 1984, 59-23701; Feb. 14, 1984, 59-26782

Int. Cl.[4] F01P *7/16*

U.S. Cl. 123—41.1 **21 Claims**



1. A cooling arrangement for a water-cooled internal combustion engine, which comprises a radiator, a water jacket of the internal combustion engine, a cooling water passage for circulating the cooling between said radiator and said water jacket, a cooling water temperature detecting means for outputting signal related to the cooling water temperature detecting means for outputting signal related to the cooling water temperature, an adjusting device for adjusting a circulating amount of the cooling water between said radiator and said water jacket, a cooling water temperature control means for periodically increasing and decreasing the cooling water circulating to the radiator through actuation of the adjusting device by receiving the output of the cooling water temperature detecting means, and which operates the adjusting device in the direction to increase the circulating amount when the cooling water temperature is above a set value, and in a direction to decrease said circulating amount when the cooling water temperature is below a set value, an operating condition detecting means for detecting operating condition of the internal combustion engine, and modifying means for modifying the cooling water circulating amount in the increasing direction of the adjusting device and the circulating amount in the decreasing direction of the adjusting device by said cooling water

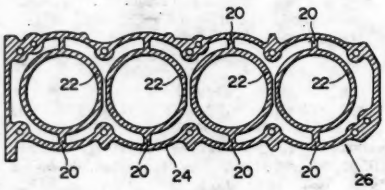
temperature control means according to the signal received from said operating condition detecting means.

4,616,600

CYLINDER BLOCK FOR INTERNAL COMBUSTION ENGINE

Yoshinori Hirano, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 30, 1983, Ser. No. 556,384
Claims priority, application Japan, Dec. 1, 1982, 57-180563[U]
Int. Cl.[4] F01P 3/22
U.S. Cl. 123—41.21 6 Claims



1. In an internal combustion engine
a cylinder block;
means defining at least one cylinder in said cylinder block;
a cylinder head attached to said cylinder block in a manner to close one end of said at least one cylinder and define a combustion chamber therein;
means defining a coolant jacket in said cylinder block, said coolant jacket surrounding said at least one cylinder;
a condenser in which gaseous coolant is condensed to its liquid form;
means for communicating between said cylinder block and said condenser for introducing liquid coolant from said condenser into said coolant jacket;
means for collecting gaseous coolant produced by the boiling of the liquid coolant introduced into said coolant jacket, said collecting means defining a cavity;
means for conveying the coolant collected in said cavity to said condenser for condensation therein;
an upper deck formed along the top of said cylinder block and against which said cylinder head is secured;
a lower deck formed along the bottom of said cylinder block;
at least one non-perforate rib member in said coolant jacket which extends between and interconnects said upper deck and said lower deck and which interconnects said at least one cylinder and said coolant jacket in a manner which partitions said coolant jacket into cell-like compartments in which coolant stagnates; and
means defining apertures in said upper deck through which the gaseous coolant produced by the boiling of the coolant in the compartments is transferred to said cavity.

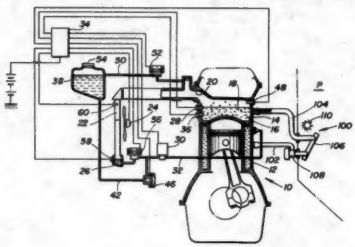
4,616,601

RADIATOR ANTI-FREEZE ARRANGEMENT FOR EVAPORATIVE TYPE COOLING SYSTEM

Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 15, 1985, Ser. No. 754,980
Claims priority, application Japan, Jul. 16, 1984, 59-147400
Int. Cl.[4] F01P 3/22
U.S. Cl. 123—41.21 8 Claims

1. A boiling liquid cooling system for an engine, comprising:
means defining in the engine a coolant jacket into which coolant is introduced in liquid state through an inlet port formed in the engine and from which coolant is discharged in gaseous state through an outlet port formed in the engine;
a radiator into which gaseous coolant from said outlet port is introduced to be liquefied;
a coolant container connected to said radiator to contain therein the coolant liquefied by said radiator;
an electric pump by which the liquid coolant in said coolant container is pumped into said coolant jacket through said inlet port;
conduit means connecting said outlet port, said radiator, said coolant container, said electric pump and said inlet port in this order to form a hermetically closed coolant circulation circuit;
first and second coolant level sensors disposed in said coolant jacket to detect first and second coolant levels in the jacket respectively, said second coolant level being higher than said first coolant level; and



control means for controlling said electric pump in such a manner that when, with the coolant in the coolant jacket being at its boiling point, the coolant in the radiator is at a temperature higher than the freezing point of the coolant, said first level sensor becomes enabled disabling said second level sensor thereby to control said electric pump to keep the coolant level in said coolant jacket at said first coolant level, while, when, with the coolant in the coolant jacket being at its boiling point, the coolant in the radiator comes to its freezing point or points around the same, said second level sensor becomes enabled disabling said first level sensor thereby to control electric pump to keep the coolant level in said coolant jacket at said second coolant level.

4,616,602

COOLING SYSTEM FOR AUTOMOTIVE ENGINE OR THE LIKE

Yoshinori Hirano, Yokohama, and Takao Kubozuka, Yokosuka, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 3, 1985, Ser. No. 751,536
Claims priority, application Japan, Jul. 6, 1984, 59-140378
Int. Cl.[4] F01P 3/22, 1/10
U.S. Cl. 123—41.27 5 Claims

1. In an internal combustion engine having a structure subject to high heat flux;
a cooling circuit for removing heat from said engine comprising:
a coolant jacket formed about said structure, said coolant jacket being arranged to receive coolant in liquid form and discharge same in gaseous form;
a radiator in which the gaseous coolant produced in said coolant jacket is condensed to its liquid form;
a vapor transfer conduit leading from said coolant jacket to said radiator for transfering gaseous coolant from said coolant jacket to said radiator;
a device associated with said radiator for varying the rate of heat exchange between said radiator and a cooling medium surrounding the radiator;
a liquid coolant return conduit leading from said radiator to

said coolant jacket for returning coolant condensed to its liquid state in said radiator to said coolant jacket;

a reservoir the interior of which is maintained constantly at atmospheric pressure;

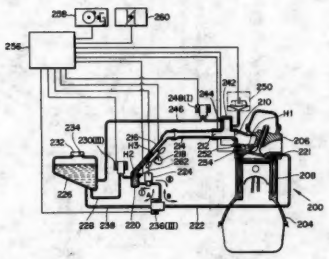
valve and conduit means for selectively interconnecting said reservoir and said cooling circuit, said valve and conduit means including a three-way valve disposed in said return conduit and a level control conduit leading from said three-way valve to said reservoir, said three-way valve having a first state wherein fluid communication between said radiator and said coolant jacket is interrupted and communication between said radiator and said reservoir established, and a second state wherein communication between said reservoir and said radiator is interrupted and communication between said radiator and said coolant jacket established;

a reversible pump disposed in said coolant return conduit at a location between said radiator and said three-way valve, said pump being selectively energizable to pump coolant in (a) a first flow direction from said radiator toward said three-way valve and (b) in a second flow direction from said three-way valve toward said radiator;

a first sensor for sensing a parameter which varies with the temperature of the liquid coolant in said coolant jacket;

a second sensor for sensing a parameter which varies with the load on the engine; and

a control circuit responsive to said first and second sensors for controlling the operation of said device, said valve and conduit means and said pump, said control circuit including means for:



determining the operational mode of the engine;

deriving a target temperature at which the liquid coolant in said coolant jacket should be maintained;

operating said device in a manner to vary the rate of condensation in said radiator and bring the temperature of the coolant in said coolant jacket to said target temperature, and

operating said three-way valve and said pump in a manner to vary the amount of coolant in said cooling circuit and therefore modify the pressure prevailing in said cooling circuit in a manner which tends to bring the temperature of the coolant to said target temperature.

5. A method of cooling an internal combustion engine comprising the steps of:

introducing liquid coolant into a cooling circuit which includes a coolant jacket formed about structure of the engine subject to high heat flux;

permitting the coolant in said coolant jacket to boil and produce coolant vapor;

transferring the coolant vapor to a radiator which defines a further section of said cooling circuit;

condensing the coolant to its liquid form in said radiator;

sensing operational parameters of said engine;

sensing the temperature of the coolant in said coolant jacket;

using the data obtained during said step of sensing operational parameters to derive a target temperature at which the coolant in said coolant jacket should be maintained under the instant set of operational conditions;

using a device located externally of said radiator to vary the rate of heat exchange between the radiator and a cooling medium surrounding said radiator in a manner which tends to bring the temperature of said coolant to said target temperature;

using a reversible pump to pump coolant into and out of said coolant circuit in a manner which varies the pressure prevailing in said cooling circuit in a manner which tends to bring the temperature of said coolant to said target temperature.

4,616,603

CYLINDER LINER FOR A MULTI-CYLINDER INTERNAL COMBUSTION ENGINE AND AN ENGINE BLOCK THEREFOR

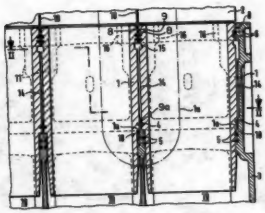
Heribert Kubis, Nürenberg, and Josef Winter, Rednitzhembach, both of Fed. Rep. of Germany, assignors to M.A.N. Nutzfahrzeuge GmbH, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 530,217, Sep. 8, 1983, abandoned. This application Feb. 13, 1985, Ser. No. 701,789

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1982, 3233578

Int. Cl.[4] F02F *1/16*

U.S. Cl. 123—41.84 **4 Claims**



1. A process for making a multi-cylinder internal combustion engine having a wet cylinder liner with a cylinder therein for each cylinder of the engine and an individual cylinder head therefor, comprising:

providing each cylinder liner with an outside shoulder near one end for support from a seat in one, crankcase end of the engine;

providing a sealing land of the outside of each cylinder liner generally parallel to the cylinder therein and near the other end of the cylinder liner;

separating each two cylinder liners from each other with a web at the opposite, cylinder head end of the engine such that each cylinder liner has a slight superelevation therefrom sufficient for compression sealing by the individual cylinder head thereon toward the shoulder;

bolting each cylinder head to the engine for the compression sealing to the cylinder liner therefor;

sealing the sealing land of each two cylinder liners to the web therebetween without affixation for sealing a coolant spaced therebelow, toward the crankcase end of the engine and without any contact between the web and the cylinder heads thereat; and

designing each cylinder liner at the end near the sealing land without any flange enlargement for the compression sealing by the cylinder head therefor to the shoulder.

3. In a multi-cylinder internal combustion engine having a block and a wet cylinder liner for each cylinder, the improvements comprising:

an outside shoulder on each cylinder liner near one end for sealingly seating near the crankcase end of the engine block so as to define a coolant space about the thereby wet cylinder liner toward the opposite, cylinder head end of the engine;

a cylinder head for each cylinder liner;

means comprising an opposite, flangeless end on each cylinder liner for compression sealing by the cylinder head therefor toward the shoulder;

bolts bolting each cylinder head to the engine block for providing the compression for sealing each cylinder head to the cylinder liner therefor;

a web of the engine block across the coolant space at the flangeless end of the cylinder liner and having a sealing land said flangeless end of each cylinder liner being superelevated from the web relative to the shoulder; and

a sealing land on the outside of each cylinder liner neat the flangeless end thereof and generally parallel to the cylinder therein for sealing without affixation to the sealing land on the web.

4,616,604

STATOR-ROTOR PISTON INTERNAL COMBUSTION ENGINE

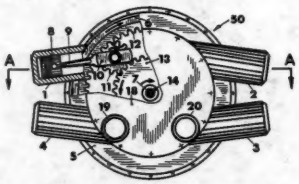
Borislav Ivanov, and Raina Ivanova, both of Stephan-Born-Str. 1, 6200 Weisbaden, Fed. Rep. of Germany

PCT No. PCT/EP83/00249, § 371 Date Oct. 17, 1983, § 102(e) Date Oct. 17, 1983, PCT Pub. No. WO85/01548, PCT Pub. Date Apr. 11, 1985

PCT Filed Sep. 28, 1983, Ser. No. 548,863

Int. Cl.⁴ F02B *75/22*

U.S. Cl. 123—55 AA **1 Claim**



1. A stator-rotor piston internal combustion engine, comprising:

a pair of mirror-image stator halves having an inner section in abutment and operatively connected to one another;

a plurality of cylinders disposed in an outer section of said stator halves, said stator halves having an equal number of cylinders with one another, each cylinder having,

a piston disposed therein,

a single connecting rod operatively connected at one end to said piston;

an individual crankshaft for each piston operatively connected to another end of a respective one of said connecting rods, and

a drive gear mounted coaxially with each of said crankshafts;

a flat rotor connected to an output engine shaft via a connection means, said rotor being disposed between and within said stator halves;

a pair of internal gear rings surrounded by said rotor, one fixed to each side of said rotor being spaced apart and on opposite sides of said connecting means, said gear rings having gear teeth on a radially inner portion thereof;

a pair of spaced apart auxiliary gears disposed radially inwardly and spaced from said interal ring gears with one of said auxiliary gears on each side of said rotor connecting means and being rotatable with respect to said rotor, said auxiliary gears having gear teeth on an outer periphery thereof, and wherein all of said drive gears have equal pitch diameter with and are spaced apart from one another and are engaged on an outer side thereof with the gear teeth of one of said internal gear rings, and on an inner side thereof with the gear teeth of one of said auxiliary gears, to transmit force from the pistons to the output engine shaft;

a pair of annular plates, one each mounted between each stator half and the rotor adjacent an outwardly facing surface of a respective one of said internal ring gears, each plate having bearing means for supporting internal ends of the crankshafts; and

a pair of engine lids, one each mounted on an outer side, away from said rotor, of each stator half, each lid having bearing means for supporting said output engine shaft and outer ends of the crankshafts.

4,616,605

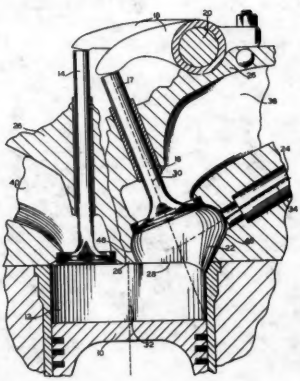
TWO-CYCLE ENGINE WITH IMPROVED SCAVENGING

Herbert E. Kline, P.O. Box 24, Claverack, N.Y. 12513

Filed Dec. 31, 1984, Ser. No. 688,070

Int. Cl.⁴ F02B *75/02*; F02D *39/04*

U.S. Cl. 123—65 VD **17 Claims**



1. An improved two-cycle internal combustion engine comprising:

a cylinder;

a cylinder head having an exhaust valve and an open type combustion chamber located therein, said chamber and exhaust valve being located in side-by-side relationship on opposite sides of a central axis of the cylinder;

an air inlet valve located within and in the top of the combustion chamber, said inlet valve having a valve stem located overhead said cylinder;

a piston reciprocally disposed with the cylinder;

means for converging a flow of scavengering air beneath the inlet valve into a colimated column as it enters the cylinder, said converging means comprising the combustion chamber having a generally oblate configuration with sides converging downwardly to form an opening which overlies the opposed sides with predetermined different angles of curvature; and

wherein the inlet valve and the combustion chamber are coaxially aligned and oriented to the central axis of the cylinder at a predetermined angle and wherein the flow of scavenging air is directed toward and along an inside wall of the cylinder, said inside wall being on the same side of the cylinder axis as the combustion chamber.

4,616,606

INTERNAL COMBUSTION ENGINE AND CAM DRIVE MECHANISM THEREFOR

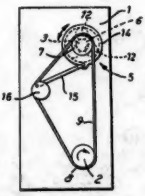
Thomas T. Ma, Chelmsford, United Kingdom, assignor to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 696,621, Jan. 30, 1985, abandoned, Division of Ser. No. 386,851, Apr. 9, 1982, abandoned. This application Jan. 22, 1986, Ser. No. 822,675

Claims priority, application United Kingdom, Apr. 13, 1981, 8111692

Int. Cl.[4] F01L *1/34*

U.S. Cl. 123—90.17 2 Claims



1. A cam drive mechanism for driving the camshaft of a four-stroke internal combustion engine having one or more sets of n number of cylinders where n is a positive integer, a piston connected to a crankshaft and reciprocable in each cylinder and being either in phase or out of phase with any other piston in the set to which it belongs by a phase angle A°, or an integral multiple thereof, and a camshaft carrying a plurality of rotatable cams for actuating inlet and/or exhaust valves for each cylinder in the set, characterized in the cam drive mechanism comprising means for rotating the camshaft with a rotational movement which is a combination of a circular motion about its axis of rotation which has a predetermined phase relationship with the circular movement of the crankshaft and an oscillatory motion about its axis of rotation to advance and retard the angular position of the cams relative to the valves with which they are associated, the oscillatory motion having a predetermined phase relationship with the crankshaft, and means for varying the amplitude of the oscillatory motion whereby the timing of the opening and closing of the valve may be varied, characterized in that the speed of the circular movement of the camshaft is half the speed of the crankshaft and the frequency of oscillations of the camshaft is f times the frequency of rotation of the crankshaft, wherein:

f=2n when the number of engine cylinders n=1;

f=n or n/2 when n=2;

f=n/2 when n=3 or more;

the cam drive mechanism means comprising a drive member rotatable by the crankshaft, and a plurality of connections between the drive member and camshaft for translating rotational movement of the drive member into a concurrent rotation of the camshaft and a continuous oscillation of the camshaft relative to the drive member superimposed upon the rotational movement, the connections including a planetary gear train having a plurality of gears including a ring gear, a sun gear, and a planet gear rotatably mounted on a planet carrier, one of the connections connecting one of the gears to the drive member for concurrent rotation, means connecting another part of the gear train to the camshaft, and linkage means connecting the drive member to a further one of the gears for automatically and continuously oscillating the further one of the gears to continuously vary the relative angular orientation between the one gear and the another part of the gear train for oscillating the camshaft relative to the drive member, the drive member comprising a crank wheel connected by the linkage means to the further gear, a pivot slidable along the linkage means to vary the oscillatory movement of the further gear, and means to slide the pivot.

4,616,607

VALVE DRIVING DEVICE FOR INTERNAL COMBUSTION ENGINE

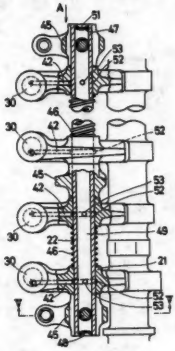
Hisashi Kodama, Nagoya, and Takuro Ono, Chiryu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 1, 1985, Ser. No. 697,163

Claims priority, application Japan, Mar. 22, 1984, 59-55659

Int. Cl.[4] F01L *1/18*

U.S. Cl. 123—90.46 6 Claims



1. A valve driving device for an internal combustion engine, of a type which includes a hydraulic lifter encased in each rocker arm for receiving a driving force at a first end thereof and for operating a valve stem at a second end thereof, and a rocker shaft swingably supporting the rocker arm, the device, comprising:

first oil passage means formed through an internal bore of the rocker shaft for supplying an operational oil to a reservoir formed in said hydraulic lifter;

second oil passage means formed through a rocker support supporting said rocker shaft for supplying the oil into said first oil passage;

air exhaust port means for exhausting air located in an upper part of said internal bore of said rocker shaft to outside;

an oil filter provided in said second oil passage means for removing impurities from said oil; and

third oil passage means formed through said rocker air for interconnecting said reservoir and said first oil passage wherein said third passage means opens into said reservoir at an upper part thereof and wherein a connection between said first oil passage means and said third oil passage means further comprises an annular passage formed around said rocker shaft and fourth passage means formed through said rocker shaft.

4,616,608

BALANCER DEVICE FOR A RECIPROCATING ENGINE

Mitsuo Shiga, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 29, 1984, Ser. No. 676,006

Claims priority, application Japan, Dec. 1, 1983, 58-184589[U]

Int. Cl.[4] F16F *15/26*

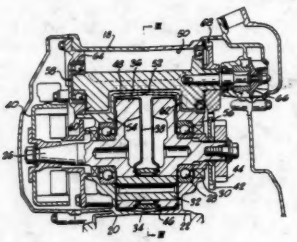
U.S. Cl. 123—192 B 4 Claims

1. A reciprocating engine, comprising

a crankcase having a crank chamber and a balance chamber and a wall between said crank chamber and said balance chamber, said wall including three sections, a first section concave to said crank chamber, and second and third sections concave to said balance chamber, said second and third sections being to either side of said first section and said first section extending toward said balance chamber

beyond a projection of the concave surfaces of said second and third sections;

a crankshaft rotatably mounted in said crank chamber; and



a balance shaft rotatably mounted in said balance chamber and having balance weights on said shaft positioned and arranged to pass to either side of said first section when rotated with said shaft.

4,616,609

OIL CIRCULATION CIRCUIT FOR INTERNAL COMBUSTION ENGINE, AND METHOD OF CIRCULATING LUBRICATING OIL

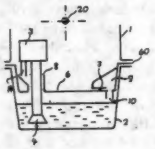
Otto Münch, Lindenweg 11, CH-5703 Seon, and Thomas Schibli, Beatusstrasse 38, CH-3008 Bern, both of Switzerland

Filed Jun. 27, 1985, Ser. No. 749,577

Claims priority, application Switzerland, Jun. 29, 1984, 3135/84

Int. Cl.⁴ F01M *1/00*

U.S. Cl. 123—196 AB **19 Claims**



1. In combination with an internal combustion engine,

a forced-oil circulation circuit including an oil pump (3) having a suction inlet (4), and

means (2, 30) for cooling oil circulating in the forced-flow circuit,

comprising, in accordance with the invention,

means for controlling cooling of oil circulating in the forced-oil flow circulation circuit as a function of viscosity of the oil being circulated by the pump (3) including

means (6, 28) for receiving oil;

a first controlled outlet (8, 89, 88) from the oil receiving means directing oil to the suction inlet (4) of the pump;

and a second outlet (9, 23, 32) including means (7, 67, 77, 78, 79, 710, 711) for introducing resistance to the flow of oil through the second outlet, wherein the resistance is a function of the viscosity of the oil, the second outlet directing oil to the oil cooling means (2, 30),

said oil cooling means being in flow communication with the suction inlet (4) of the pump.

4,616,610

LUBRICATING APPARATUS IN INTERNAL COMBUSTION ENGINE

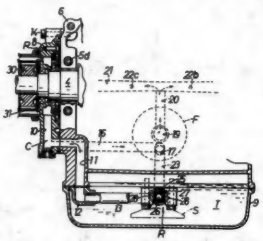
Atsushi Ishida, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1985, Ser. No. 716,820

Claims priority, application Japan, Mar. 27, 1984, 59-43652[U]

Int. Cl.⁴ F01M *1/00*

U.S. Cl. 123—196 A **7 Claims**



1. A lubricating apparatus in an internal combustion engine of the horizontal type having a cylinder block, comprising a crank shaft bearing cap mounted on the cylinder block, a main gallery provided in the bearing cap and extending substantially parallel to the crank shaft, an oil filter mounted on said bearing cap at substantially midlength of the main gallery, said oil filter having an inlet in communication with an oil pump and an outlet in communication with the main gallery at substantially its midlength.

4,616,611

PRECOMBUSTION CHAMBER CONSTRUCTION OF INTERNAL COMBUSTION ENGINE

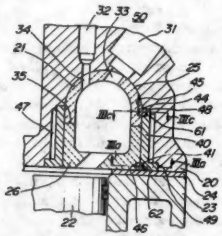
Yutaka Ogawa; Takayuki Ogasawara, and Shigeru Hanzawa, all of Nagoya, Japan, assignors to NGK Insulators, Ltd. and Mazda Motor Corporation, both of, Japan

Filed Oct. 11, 1985, Ser. No. 786,487

Claims priority, application Japan, Oct. 16, 1984, 59-155014[U]; Aug. 27, 1985, 60-129466[U]

Int. Cl.⁴ B41F *13/54*

U.S. Cl. 123—270 **5 Claims**



1. A precombustion chamber construction of an internal combustion engine, including an upper ceramic body, a lower ceramic body abutting against the upper ceramic body to form a precombustion chamber communicating through an injection hole with a main combustion chamber of the internal combustion engine, and a metal ring member fitted on outer circumferences of said upper and lower ceramic bodies, said precombustion chamber construction comprising a first key member whose part is received in a cut-away portion formed in said outer circumference of said upper ceramic body in the proximity of an upper end of said metal ring member and whose

remaining part is received in a groove formed in an inner circumference of the upper end of the metal ring member corresponding to said cut-away portion of the upper ceramic body, and a second key member whose part is received in a cut-away portion formed in the outer circumference of the lower ceramic body in the proximity of a lower end of the metal ring member and whose remaining part is received in a groove formed in an inner circumference of the lower end of the metal ring member corresponding to the cut-away portion of the lower ceramic body.

4,616,612

INTERNAL COMBUSTION ENGINE PISTON

Phillip A. Jane, Peterborough, England, assignor to Perkins Engines Group Limited, London, England

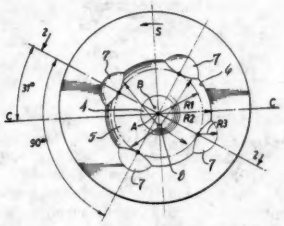
PCT No. PCT/GB84/00224, § 371 Date Feb. 11, 1985, § 102(e) Date Feb. 11, 1985, PCT Pub. No. WO85/00198, PCT Pub. Date Jan. 17, 1985

PCT Filed Jun. 25, 1984, Ser. No. 700,579

Claims priority, application United Kingdom, Jun. 28, 1983, 8317453

Int. Cl.⁴ F02B *19/08*

U.S. Cl. 123—276 **6 Claims**



1. An internal combustion engine piston having a combustion bowl recessed in the crown of the piston and a plurality of recesses formed in the side wall of the bowl so as to extend substantially the full depth of the bowl and which are arcuate in cross-section and spaced apart by arcuate intermediate portions of the side wall, characterised in that the ratio of the maximum distance by which each recess (7) extends radially into the side wall (6) compared with the radius of the side wall (6), lies within the range of 0.10 to 0.20.

4,616,613

DEVICE FOR ELECTRIC REGULATION OF IDLE OF INTERNAL COMBUSTION ENGINES

Harald Collonia, Glasshütten, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 29, 1985, Ser. No. 696,126

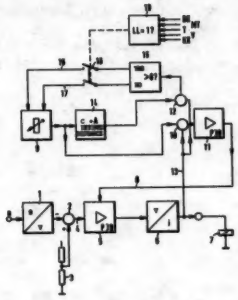
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1984, 3403750

Int. Cl.⁴ F02M *3/07*

U.S. Cl. 123—339 **8 Claims**

1. In a device for electrically controlling the idling of internal combustion engines, particularly in automotive vehicles having an idle flow setting element, a comparator wherein an idling speed-of-rotation/control deviation signal is formed, and a speed-of-rotation regulator, and wherein the comparator and the regulator control a setting current which can be fed into the idle airflow setting element, the device having means for adjusting the setting current, the improvement wherein

the device further comprises a control limiting unit which adjusts itself as a function of the setting current upon idling and which limits the maximum setting current to a value which is a predetermined amount above the idling



setting current, said control limiting unit being connected to the regulator.

4,616,614

SYSTEM FOR REGULATING THE IDLE SPEED OF AN INTERNAL COMBUSTION ENGINE

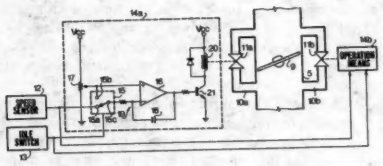
Kunihiro Abe, Higashimurayama, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 557,085, Dec. 1, 1983, abandoned. This application Jul. 18, 1985, Ser. No. 756,571

Claims priority, application Japan, Dec. 3, 1982, 57-212444

Int. Cl.⁴ F02D *11/10*

U.S. Cl. 123—339 **4 Claims**



1. In a system for regulating the idle speed of an internal combustion engine with an electronic fuel injection system having an air flow bypass around a throttle valve of the engine and at least one solenoid operated control valve having at least one solenoid provided in the bypass to control the volume of air flow passing through the bypass, the improvement comprising:

first means for sensing speed of said engine and for producing an engine speed signal;

at least one second means for producing a reference voltage corresponding to a predetermined idle speed;

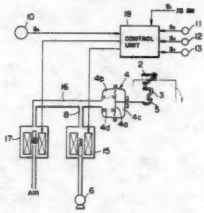
integration operating means operatively for producing during idle operation of said engine a regulating signal dependent on the difference between said engine speed signal and said reference voltage, the regulating signal comprising simultaneously a first integration component, the value of the latter relatively rapidly increasing, and a second integration component, the value of the latter relatively slowly increasing; and

a driver responsive to said regulating signal for energizing at least one said solenoid of at least one said solenoid operated control valve to actuate at least one said control valve in a manner dependent on said first and second integration components to regulate the idle speed to the predetermined idle speed so as to converge thereto with minimized hunting.

4,616,615
METHOD AND SYSTEM FOR CONTROLLING IDLING SPEED FOR A DIESEL ENGINE

Hiroyuki Kawaguchi, Yokohama; Hideyuki Saito, Tokyo, and Seishi Yasuhara, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Jan. 12, 1984, Ser. No. 570,260
Claims priority, application Japan, Jan. 18, 1983, 58-6385
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—339 **17 Claims**



1. A system for controlling the idling speed of a vehicular Diesel engine, the engine having a member for controlling an amount of fuel supplied to the engine according to the position thereof, comprising:

(a) A stop member, engaged with said control member during engine idling within a positional range said control member displaces, for limiting the amount of fuel supplied to the engine from said control member during engine idling;

(b) means for selectively adjusting a position of said stop member within the positional range of said control member during engine idling such that the engine idling speed approaches a target idling speed determined according to engine operating conditions at the time of idling,

(c) said means for selectively adjusting comprising:

(i) a pressure-responsive actuator linked with said stop member which actuates said stop member according to pressure introduced thereinto;

(ii) a normally closed first valve means which operatively opens to introduce a negative pressure into said actuator so that said control member mediates an increased amount of fuel supply to the engine via said stop member;

(iii) a normally open second valve means which opens to introduce the atmospheric pressure into said actuator so that said control member mediates a decreased amount of fuel supply to the engine via said stop member;

(iv) a control means which selectively closes or opens said first and second valve means such that the engine idling speed approaches the target idling speed, the target idling speed being set according to the engine operating conditions, and

(d) a normally closed third valve means which is opened or closed by said control means in place of said second valve means when the engine idling speed does not settle to the target idling speed until a predetermined period of time has elapsed.

4,616,616
FUEL CONTROL SYSTEM

Waldemo A. Staniak, Geneva, Switzerland; Robert E. Samuelson, Washington, and Michael E. Moncelle, Normal, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Aug. 29, 1983, Ser. No. 527,043
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—357 **22 Claims**

1. A fuel control system (70) comprising:

a fuel rack (15) movable in opposite fuel-increasing and fuel-decreasing directions;

a rack control member (16) movable in opposite fuel-increasing and fuel-decreasing directions;

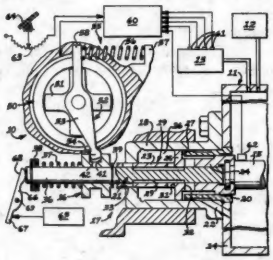
servo system means (17) for moving said fuel rack in response to movement of said rack control member (16);

an electrically energizable member (51) movable in opposite fuel-increasing and fuel-decreasing directions, said electrically energizable member (51) being urged to move in its fuel-decreasing direction when energized;

first coupling means (52) for connecting said electrically energizable member (51) to said rack control member (16) to move said rack control member (16) in its fuel-decreasing direction in response to movement of said electrically energizable member (51) in its fuel-decreasing direction;

a mechanical governor control (80) having a member (90) movable in opposite fuel-increasing and fuel-decreasing directions;

second coupling means (98) for connecting said mechanical



governor (80) to said rack control member (16) to move said rack control member (16) in its fuel-decreasing direction in response to movement of said mechanical governor member (90) in its fuel-decreasing direction, said second coupling means having the further functions of allowing the position of said rack control member (16) to be controlled solely by said electrically energizable member (51) when said electrically energizable member (51) has been urged to move by the energization thereof to a position calling for less fuel than the position of said mechanical governor member (90), and of enabling the position of said rack control member (16) to be controlled by said mechanical governor member (90) when said mechanical governor member (90) is at a position calling for less fuel than the position to which said electrically energizable member (51) has been urged by the energization thereof;

bias means (55) for biasing said rack control member (16) to move in its fuel-increasing direction.

4,616,617
METHOD AND ARRANGEMENT FOR COMBUSTION CHAMBER IDENTIFICATION IN AN INTERNAL COMBUSTION ENGINE

Istvan Geiger, Brunswick, and Uwe Waschatz, Meine, both of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Apr. 8, 1985, Ser. No. 720,543
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1984, 3413271
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—436 **7 Claims**

1. A method for combustion chamber identification in an internal combustion engine having a plurality of combustion chambers and a plurality of injection valves individually related to said combustion chambers, comprising the steps of:

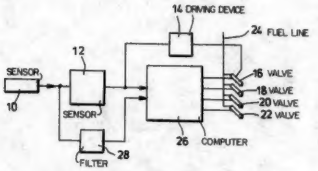
sensing the rotational speed of the engine;

detecting any unevenness or hunting in the sensed engine speed;

altering the duration of fuel injection of a selected injection valve in response to any detected unevenness by an

amount sufficient to cause additional hunting in the engine speed;

determining the interval in time or crank angle between the additional hunting and the unevenness; and



deriving, from the determined interval, an identification signal indicating the combustion chamber causing the unevenness.

4,616,618

APPARATUS FOR METERING AN AIR-FUEL MIXTURE TO AN INTERNAL COMBUSTION ENGINE

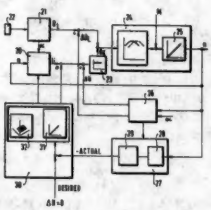
Eberhard Blöcher, Schwieberdingen; Ferdinand Grob, Besigheim; Peter-Jürgen Schmidt, Schwieberdingen, and Josef Wahl, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 30, 1985, Ser. No. 696,651

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1984, 3403394

Int. Cl.⁴ F02B *3/00*

U.S. Cl. 123—478 **5 Claims**



1. Apparatus for metering an air-fuel mixture to an internal combustion engine equipped with fuel injection means, the apparatus comprising:

an optimzer arrangement for controlling to a minimal specific consumption of fuel, the arrangement including test signal generator means for acting upon the fuel metered to the engine;

means for applying the rotational speed of the engine and the metering signal indicative of the duration of injection of the fuel as actual-value information for controlling to the minimal specific consumption value; and,

the quotient of the change in rotational speed change Δn and the change in the duration of fuel injection Δt_e being determined for detecting the actual value.

4,616,619

METHOD FOR CONTROLLING AIR-FUEL RATIO IN INTERNAL COMBUSTION ENGINE

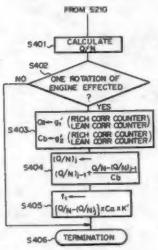
Kimitaka Saito, Okazaki; Tokio Kohama, Nishio; Tsuneyuki Egami, Nukata; Tsutomu Saito, Okazaki; Hiroshi Takahashi, Toyota, and Kunihiko Sato, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jul. 13, 1984, Ser. No. 630,682

Claims priority, application Japan, Jul. 18, 1983, 58-129497; Jul. 21, 1983, 58-131814

Int. Cl.⁴ F02D *41/14*

U.S. Cl. 123—489 **32 Claims**



1. A method for controlling air-fuel ratio in an internal combustion engine comprising the steps of:

(1) every time the engine has rotated through a predetermined crank angle, obtaining a factor value for deciding a correction amount of fuel injection corresponding to an acceleration/deceleration state of the engine;

(2) calculating the blunted value of said obtained factor value obtained by said obtaining step (1);

(3) obtaining a correction amount of transient fuel injection from said factor value obtained by said obtaining step (1) and said blunted factor value calculated by said calculating step (2);

(4) detecting deviation of the air-fuel ratio of said engine from a predetermined reference air-fuel ratio during the acceleration or deceleration of the engine;

(5) correcting said correction amount of transient fuel injection obtained by said obtaining step (3) in response to said air-fuel ratio deviation detected by said detected step (4) every time the engine has rotated through said predetermined crank angle; and

(6) supplying the engine with an amount of fuel controlled by said transient fuel injection correction amount as corrected by said correcting step (5).

4,616,620

CONTAMINATION CONTROL APPARATUS

John A. Paoluccio, 3530 Kiernan St., Modesto, Calif. 95356

Continuation of Ser. No. 551,360, Nov. 14, 1983, abandoned. This application Sep. 17, 1985, Ser. No. 777,557

Int. Cl.⁴ F02M *25/06*

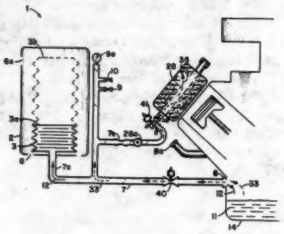
U.S. Cl. 123—573 **12 Claims**

1. An internal combustion engine, which comprises:

an engine having a crankcase;

a container for collecting crankcase vapors, said containers having a desiccant disposed therein, said container being positioned in heat exchange relation to said engine; and means for providing fluid communication alternately between (1) a first position coupling said container to at least a part of said crankcase of said engine when said engine is not operating in order to supply a crankcase vapors to the container and (2) a second position coupling said container to ambient when said engine is operating, said desiccant absorbing crankcase vapors when said engine is not running and releasing the crankcase vapors

previously absorbed to the atmosphere when said engine is not running whereby in order that crankcase vapors



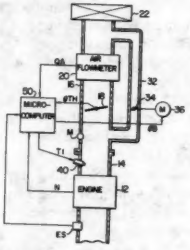
contained therein are released by the heated desiccant to the atmosphere.

4,616,621

METHOD OF AIR-FUEL RATIO CONTROL OF INTERNAL COMBUSTION ENGINES OF AUTOMOBILES

Hiroshi Kuroiwa, Hitachi, and Yoshishige Oyama, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 18, 1983, Ser. No. 542,994
Claims priority, application Japan, Oct. 18, 1982, 57-181283
Int. Cl.[4] F02B *3/00*
U.S. Cl. 123—585 **8 Claims**



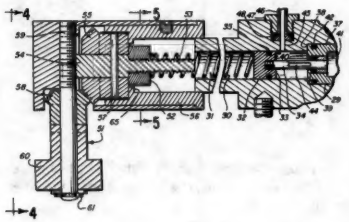
1. A method of air-fuel ratio control for an internal combustion engine of an automobile, in which the fuel amount to be supplied to the internal combustion engine is determined by detecting only the air amount passing through a main air intake path having a throttle valve therein, controlling the air amount passing through a bypass formed in addition to the main air intake path, said bypass having an inlet coupled to said main air intake path at a location thereof upstream of the location whereat the air amount passing through said main air intake path is detected and an outlet coupled to said main air intake path at a location thereof downstream of the location of said throttle valve, so as to attain a predetermined air-fuel ratio for a lean gas mixture determined for a predetermined operating range of the automobile, thereby performing the lean mixture gas operation in said predetermined operating range, determining the fuel amount in accordance with the output from a sensor provided at said main intake path for detecting only the amount of air passing through the main air intake path, calculating the opening of said bypass suitable for obtaining said predetermined air-fuel ratio and controlling said opening of the bypass in accordance with said calculated bypass opening.

4,616,622

PRESSURE-REGULATED GAS GUN

Keith Milliman, Fairport, N.Y., assignor to The Coleman Company, Inc., Wichita, Kans.

Filed Aug. 10, 1984, Ser. No. 639,399
Int. Cl.[4] F41B *11/00*
U.S. Cl. 124—73 **10 Claims**



1. In a gas gun having a source of pressureized gas and a gas chamber for storing pressurized gas for propelling a projectile from the gun, a pressure regulator assembly comprising:

(a) valve means between the source of pressurized gas and the gas chamber for permitting gas to flow from the source of pressurized gas to the gas chamber until the pressure of the gas in the gas chamber reaches a predetermined level, the valve means including a gas seal between the source of pressurized gas and the gas chamber and a piston slidably movable in the seal between a first position in which pressurized gas can flow from the source of pressurized gas to the gas chamber and a second position in which gas flow between the source of pressurized gas in the gas chamber is prevented; and

(b) valve-adjusting means for adjusting the predetermined level of the pressure of the gas in the gas chamber, the valve-adjusting means including a spring resiliently biasing the piston toward its first position, a knob rotatably mounted on the exterior of the gun, a first gear attached to the knob for rotation therewith, a second gear meshing with first gear for rotation therewith, a screw attached to the second gear for rotation therewith, and a spring stop threadedly mounted on the screw for axial movement therealong, the spring stop engaging said spring whereby axial movement of the spring stop on the screw adjusts the compression of the spring.

2. The structure of claim 1 in which a slot extends transversely through the piston, the slot extending on both sides of the gas seal when the piston is in its first position whereby gas can flow from the source of pressuzied gas through the slot and into the gas chamber.

4,616,623

INTERCHANGEABLE SIGHT MOUNT FOR BOWS

Paul D. Williams, 9241 Davison, Davison, Mich. 48423

Filed Dec. 9, 1983, Ser. No. 559,750
Int. Cl.[4] F41B *5/00*
U.S. Cl. 124—87 **7 Claims**

1. A mount for an archery bow which may interchangeably be employed to mount different sights comprising:

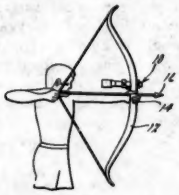
a bow mounting bracket affixed to the bow, said bow mounting bracket having at least one slot for enabling the vertical position of said bow mounting bracket to be adjusted with respect to the bow;

a sliding bracket slidably affixed to said bow mounting bracket, a slot in said sliding bracket for enabling said sliding bracket to slide with respect to said bow mounting bracket;

an intermediate bracket rotatably affixed to said sliding bracket, said intermediate bracket having a limited range

of rotation with respect to said sliding bracket about a first axis;

a sight mounting plate having a hole for rotatably attaching said sight mounting plate to said intermediate bracket, said



sight mounting plate having a limited range of rotation, with respect to said intermediate bracket about a second axis, and said second axis is perpendicular to said first axis; and

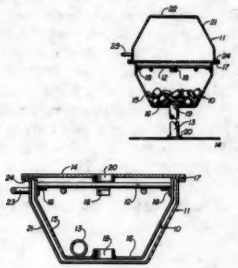
means for mounting a sight to said sight mounting plate.

4,616,624

PORTABLE GRILL

Robert F. Parker, P.O. Box 2551, Victoria, Tex. 77902

Filed Feb. 3, 1986, Ser. No. 825,598
Int. Cl.[4] F24C *1/16*
U.S. Cl. 126—9 R **3 Claims**



1. A knock-down nestable grill comprising

a fire pan which is open at its top and tapers downwardly and provided at its top with an outwardly directed marginal flange, the fire pan having a flat bottom wall in a plane parallel to said flange,

a cover which is open at its bottom and which tapers upwardly and having a bottom outwardly directed marginal flange adapted in a use position of the grill to abut and rest on the flange of the fire pan, the cover having a flat top wall in a plane parallel to said flanges and said bottom wall, the cover being somewhat larger in width than the fire pan, whereby the fire pan can nest within the cover when the cover is inverted so that the marginal flange of the cover underlies and supports the marginal flange of the fire pan with the walls of the fire pan and cover somewhat spaced apart during nesting,

a removable grill rack supported within the fire pan near and below the marginal flange of the fire pan, and

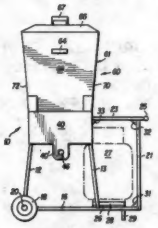
a separable pedestal means for the grill including a post having a detachable connection with the bottom wall of the fire pan and a base plate having a detachable connection with the post, the base plate after being separated from the post being adapted to rest on the marginal flange of the nested fire pan to thereby form a cover for the open top of the fire pan.

4,616,625

PORTABLE BACKYARD CRAB COOKER OR STEAMER

Beresford E. Froome, 1401 Ritchie Rd., Capitol Heights, Md. 20743

Filed Aug. 21, 1985, Ser. No. 704,050
Int. Cl.[4] F24C *1/16*; A47J *37/12*
U.S. Cl. 126—25 R **5 Claims**



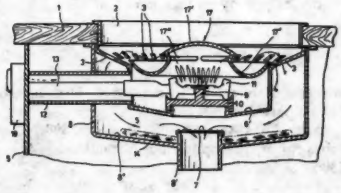
1. A portable steam heating unit for shellfish comprising: a heating assembly and a steamer assembly; said heating assembly comprising a heating base from which depends a wheeled support structure, said heating base comprising a metal frame, the vertical sides of said frame being covered by at least one metal plate, the top of said frame being covered by a metal plate having an opening therein above a liquified gas heating element assembly positioned within said frame, one of said metal plates having a depending portion which mounts a control valve for the supply of liquifed gas to said heating element, said top plate having a plurality of upwardly and outwardly extending brackets; said wheeled support structure comprising a wheel assembly at one end and a fixed depending support assembly at the opposite end, said support assembly including handle means fixed to said base; said steamer assembly comprising an outer lidded pot and an interiorly positioned pot, said inner pot having at least a perforated bottom plate with depending supports to position said inner pot above the bottom of said outer pot, said steamer assembly being fittedly positioned above said opening in said top plate of said heating base in said bracket and removable therefrom.

4,616,626

TABLE COOKER WITH VEANTILATOR

Jung K. Kwan Soon, 337-32, Hapjung-Dong, Map-Gu, Seoul, Rep. of Korea

Filed Apr. 20, 1984, Ser. No. 602,333
Int. Cl.[4] F24C *3/00*
U.S. Cl. 126—39 K **8 Claims**



1. A cooking device comprising

a table surface provided with an aperture disposed therein,

a gas burner container extending into said aperture and extending below the table surface, said gas burner container having a plurality of peripherally positioned ventilation holes disposed in the upper end thereof,

a burner means disposed in the lower end of the gas burner container below said plurality of ventilation holes,

a cooking surface disposed above said burner means the

major portion of said cooking surface extending below said ventilating holes,

a smoke collecting room disposed below the burner means, said smoke collecting room communicating with said plurality of ventilation holes, and

exhaust means connected to said smoke collecting room for drawing off the cooking gases from said smoke collecting room.

4,616,627

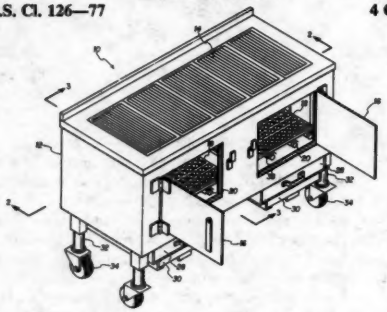
FORCED DRAFT STOVE

Lawton C. Haygood, Dallas, Tex., assignor to Lawton Haygood Corporation, Dallas, Tex.

Filed Nov. 16, 1984, Ser. No. 671,911

Int. Cl.[4] F24C *1/14*

U.S. Cl. 126—77 **4 Claims**



1. A forced draft solid fuel burning cooking device comprising:

a housing having a combustion chamber bounded by an open upper side and being substantially closed on five sides thereof;

a food support grate covering the upper open side thereof;

a solid fuel support grate disposed within said housing below and parallel to said food support grate;

air injection means disposed within said housing below said fuel support surface for injecting air across solid fuel positioned upon said fuel support grate and into said combustion chamber, said air injection means having an air supply manifold and a plurality of closed end conduits communicating with said air supply manifold, each of said conduits having a plurality of discharge openings directed toward said solid fuel support grate; and,

deflector plate means disposed intermediate said air injection means and said fuel support surface for deflecting air as it is discharged by said air injection means.

4,616,628

FIRE-GUARD

Johannes B. Ratelband, "Rijnstateflat" Utrechtsestraat 55-34, 6811 LV Arnhem, Netherlands

Filed Apr. 10, 1984, Ser. No. 598,713

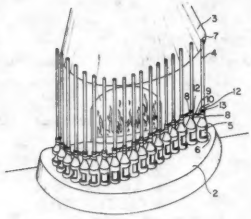
Claims priority, application Netherlands, Apr. 14, 1983, 8301306

Int. Cl.[4] F24B *7/00*

U.S. Cl. 126—121 **14 Claims**

1. A fire-guard adapted to convert radiant energy from a fire to convection flow of heated air, comprising a plurality of upstanding pipes having substantially vertical longitudinal axes, and connecting means for interconnecting said pipes in side-by-side relation so as to be disposed in a row on a supporting surface to form a screen between a fire and the space which the fire is heating:

each of said pipes having a lower portion extending to a selected height above the supporting surface and an upper portion extending coaxially therewith to a height substantially greater than said selected height, said connecting means maintaining said pipes with their longitudinal axes in parallel, upright relation with their lower portions adjacent one another and cooperating to form an air barrier extending from said supporting surface to said selected height and an air flow-through region above said selected height through which air may flow toward the fire, said lower portions having laterally facing inlet openings directed toward said space to allow cool air to flow into the interiors of said pipes below said selected height, said upper portions having openings adjacent the upper ends thereof for discharging heated air by convection into said space; and



said connecting means including hinge means connecting the pipes of at least one pair of adjacent pipes, said hinge means comprising a rigid link having its opposite end portions interconnected with said pipes such that the pipes are constrained for lateral movement with the associated ends of the link whereby the longitudinal axes of said pipes are maintained by said link at a fixed distance from one another at all times and each pipe may swing about the longitudinal axis of the opposite pipe only in an arc having a radius equal to said distance, one of said pipes also being independently rotatable about its own longitudinal axis with respect to the link whereby the other pipe may swing about the longitudinal axis of said one pipe while said one pipe remains stationary.

4,616,629

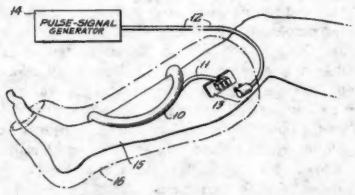
COIL CONSTRUCTION FOR ELECTROMAGNETIC TREATMENT OF AN AFFLICTED BODY REGION

John S. Moore, Upper Montclair, N.J., assignor to Electro-Biology, Inc., Fairfield, N.J.

Filed May 24, 1985, Ser. No. 737,433

Int. Cl.[4] A61N *1/42*

U.S. Cl. 128—1.5 **8 Claims**



1. An electromagnetic body-treatment device for surgically non-invasive modification of the growth, repair and maintenance behavior of living tissues and cells by a specific and selective change in electrical environment, comprising a single multi-turn electrical coil of initially generally circular configuration, wherein a central axis of symmetry extends normal to the plane of said coil, said coil having an external lead-cable connection and said coil being deformed to an extent S out of

the plane of said coil into a first body-adapting configuration which is generally U-shaped and generally symmetrically disposed on opposite sides of a first viewing plane defined by said central axis and by a first viewing-aspect axis normal to said central axis, said deformed coil being also in a second body-adapting configuration which is generally U-shaped and symmetrically disposed on opposite sides of a second viewing plane defined by said central axis and by a second viewing-aspect axis normal to said central axis and to said first viewing-aspect axis, the extent S being related to the span L between ends of one of said U-shapes and to the span W between ends of the other of said U-shapes such that

$$S = k\left(\frac{L+W}{4}\right),$$

where k is in the range 0.5 to 2.0, and means connected to said cable connection for electrically exciting said single coil with a therapeutically beneficial electrical signal; whereby, upon insertion of an afflicted body region into the U-shaped concavity of one of said configurations, a substantially uniform distribution of magnetic-flux intensity develops in a substantially prismatic volume within the included volume defined by the two U-shaped formations.

4,616,630

ENDOSCOPE WITH AN OBTUSELY ANGLED CONNECTING SECTION

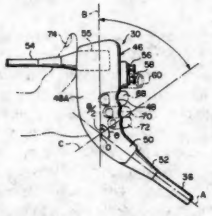
Satoshi Arakawa, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Japan

Filed Aug. 16, 1985, Ser. No. 766,413

Claims priority, application Japan, Aug. 20, 1984, 59-126264[U]; Aug. 20, 1984, 590-126265[U]

Int. Cl.⁴ A61B *1/00*

U.S. Cl. 128—4 **5 Claims**



1. An endoscope wherein a solid state imaging device is provided in the forward end of an insertion section and an object of interest is displayed on a display screen in response to a video signal obtained from said solid state imaging device, characterized in that a main body of control section of said endoscope comprises:

an elongate grip section grasped at least by a third finger and a little finger; and

a connecting section projecting obliquely downwardly from the front surface of the bottom end portion of said grip section, having a center axis A making an obtuse angle $\theta(90° < \theta < 180°)$ with a center axis B of said grip section B and being connected to the rear end of said insertion section on the same axial line.

4,616,631

FLEXIBLE PIPE ASSEMBLY FOR ENDOSCOPE

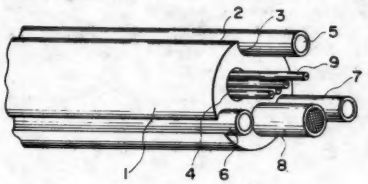
Nagashige Takahashi, Tokyo, Japan, assignor to Kabushiki Kaisha Medos Kenkyusho, Tokyo, Japan

Continuation of Ser. No. 117,416, Jan. 31, 1980, abandoned. This application Apr. 23, 1982, Ser. No. 371,168

Claims priority, application Japan, Feb. 10, 1979, 54-16206[U]

Int. Cl.⁴ A61B *1/06*

U.S. Cl. 128—6 **9 Claims**



1. An endoscope comprising: an elongate body having an axis extending along its length of flexible material having at least one hollow groove having side walls formed in outer wall portions of said body and an opening extending the length of said elongate body and cylindrical through-holes formed in the central portion of said body wherein said hollow grooves and said cylindrical through-holes extend parallel to the axis of said body; a channel forming element disposed in at least one of said hollow grooves and said cylindrical through holes and being strippable from said grooves along said opening and, endoscopic implements delivered through said channel forming elements.

4,616,632

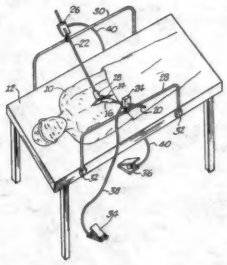
LOCK FOR RETRACTOR APPARATUS

Luis Wigoda, 841 Washington Ave., Miami Beach, Fla. 33139

Filed Jan. 31, 1985, Ser. No. 697,018

Int. Cl.⁴ A61B *17/02*

U.S. Cl. 128—20 **18 Claims**



1. Retractor apparatus for use during a surgical procedure for holding back tissue of a patient undergoing surgery, said apparatus comprising:

at least one retractor adapted to hold back said tissue;

attachment means adapted for attachment relative to an operating platform supporting said patient;

joint means for affixing said retractor to said attachment means in the position to hold back said tissue, said joint means including controllable lock means for releasing said retractor for positioning and thereafter locking said positioned retractor, said retractor being positioned by linear movement through said joint means in a direction away from said attachment means and by rotational movement in a direction about said attachment means; and

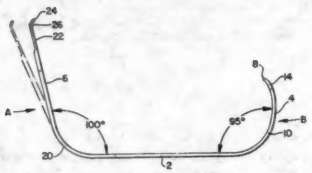
actuated controller means coupled to said lock means for controlling said lock means to release said retractor upon actuation thereof and for controlling said lock means to lock said retractor upon deactuation thereof.

4,616,633

RETRACTOR FOR USE IN ORAL AND MAXILLOFACIAL SURGERY

Arturo Vargas Garcia, Rio Piedras, P.R., assignor to Commonwealth of Puerto Rico, P.R.

Filed Mar. 7, 1985, Ser. No. 709,129
Int. Cl.[4] A61B *17/02*
U.S. Cl. 128—20 **1 Claim**



1. A retractor for soft tissue for use during oral and maxillofacial surgery formed from a strip of flat bendable material of substantially constant width and thickness, and comprising:

(a) a substantially straight handle part,

(b) a greater active blade part connected to one end of the handle part through an area of reduced thickness and extending from the handle at an obtuse angle of approximately 100° and having:

(i) an outer end part of reduced thickness having a tip end curved toward the handle and a patterened inner surface, and

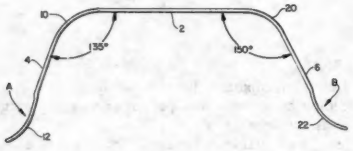
(c) a lesser active blade part connected to the other end of the handle part the outer end of which is of lesser height above the handle than the outer end of the greater active blade part and being curved throughout its length back toward the handle part through approximately 95° , the connection of the greater active blade part to the handle part being malleable to permit angular adjustment of the greater active blade part with respect to the handle part.

4,616,634

SOFT TISSUE PROTECTOR FOR USE IN ORAL AND MAXILLOFACIAL SURGERY

Arturo Vargas Garcia, Rio Piedras, P.R., assignor to Commonwealth of Puerto Rico, P.R.

Filed Mar. 7, 1985, Ser. No. 709,226
Int. Cl.[4] A61B *17/02*
U.S. Cl. 128—20 **1 Claim**



1. A unitary instrument for the protection and retraction of the soft tissues of the oral cavity during surgery formed of thin strip stainless steel and comprising:

(a) an elongated handle part of linear configuration,

(b) a first active blade part connected to one end of the handle part through a curved section and forming an obtuse angle with the handle part,

(c) a second active blade part connected to the handle part through a curved section and forming with the handle part an obtuse angle greater than the angle between the handle and the first active blade part,

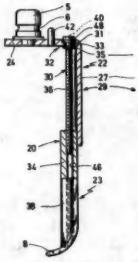
(d) each of the blade parts having at its outer end a section formed into a curve extending away from the handle part, the curved part at the outer end of the first blade part being thinner and wider than the remainder of the blade part and the curved part at the outer end of the second blade part being thinner and narrower than the remainder of the blade part.

4,616,635

SURGICAL INSTRUMENT FOR THE SPLAYING OF WOUND EDGES

Wolfhard Caspar, Bad Homburg; Theodor Lutze, Balgheim, and Theodor Schwarz, Tuttlingen, all of Fed. Rep. of Germany, assignors to Aesculap-Werke Aktiengesellschaft, Tuttlingen, Fed. Rep. of Germany

Filed Apr. 4, 1985, Ser. No. 719,687
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1984, 3412647; Mar. 19, 1985, 3509787
Int. Cl.[4] A61B *17/02*
U.S. Cl. 128—20 **11 Claims**



1. Surgical instrument for the splaying of the edges of a wound comprising at least one blade for placement on said edges having a blade shaped middle part, a rim projecting at right angles opposite the middle part, and a mount on which the blade is held at the end of the middle part opposite the projecting rim,

said middle part comprising two parts which are movable against each other, of which one is held on the mount and the other carries the projecting rim, and

an actuator that moves said two parts relative to each other and fixes them in different relative positions to each other so that different lengths of the middle part and these different spacings of the projecting rim result,

said actuator comprising a turnable rod with a screw thread section, a guide part with a screw thread complementary to the screw threads of the rod, and an abutment, whereby the guide part and the abutment are placed at different parts of the middle part and guide and hold the rod parallel to the movement direction, said rod being turnable for adjustment of said instrument from outside of the wound.

4,616,636

LIGHT EMISSION SWITCHING CIRCUIT FOR LARYNX STROBOSCOPE

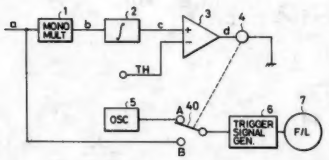
Hironobu Nagashima, and Hiroshi Koyama, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 18, 1985, Ser. No. 756,121
Claims priority, application Japan, Jul. 27, 1984, 59-156572
Int. Cl.[4] A61B *1/00*; G01P *3/40*
U.S. Cl. 128—23 **4 Claims**

1. A light emission switching circuit for use in a larynx stroboscope, comprising:

means for detecting the presence of vocal cords vibration according to a pulse period of a first pulse signal synchronous with said vocal cords vibration;

oscillator means for generating a second pulse signal having a constant frequency; and



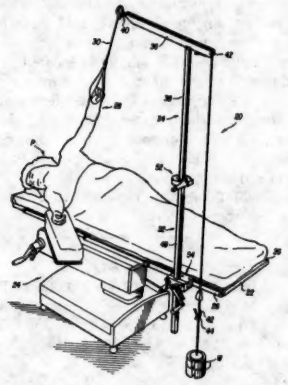
switching means for selecting, in accordance with an output of said detecting means, as an output for driving a flash lamp of said stroboscope, one of said first and second pulse signals, wherein when vocal cords vibration is detected by said detector means, light is emitted in synchronism with said vocal cords vibration, and when no vocal cords vibration is detected, light is emitted at said constant frequency.

4,616,637

SHOULDER TRACTION APPARATUS

Richard B. Caspari, Maidens; Terry L. Whipple, and James A. Thimsen, both of Richmond, all of Va., assignors to Precision Surgical Instruments, Inc., Richmond, Va.

Filed Sep. 14, 1984, Ser. No. 650,664
Int. Cl.[4] A61G *13/00*
U.S. Cl. 128—84 R **7 Claims**



1. In a shoulder traction applying apparatus, the combination which comprises

a. boom means secured to an operating table,

(1) said boom means having an upper rotatable portion which extends above and is rotatable relative to said operating table and a lower non-rotatable portion which is fixed relative to said table,

b. means secured to said lower non-rotatable portion for varying the elevation of said boom means,

c. a boom member carried by said upper rotatable portion of said boom means,

d. cord means carried by said boom member and being advanceable forwardly and rearwardly along said boom member,

e. gripping means attached to a forward end of said cord means with said gripping means gripping the arm of the patient,

f. variable means connected to a rearward end of said cord means for applying tension to said cord means whereby said tension will not increase because of movement of the patient,

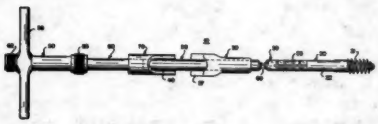
g. and gear means carried by said rotatable portion for coaction with means on said non-rotatable portion for rotating said rotatable portion of said boom means about a vertical axis.

4,616,638

COMPRESSION SCREW ASSEMBLY

Calvin Griggs, Memphis, Tenn., assignor to Richards Medical Company, Memphis, Tenn.

Division of Ser. No. 340,093, Jan. 18, 1982, Pat. No. 4,530,355.
This application Nov. 28, 1984, Ser. No. 675,937
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 BB **6 Claims**



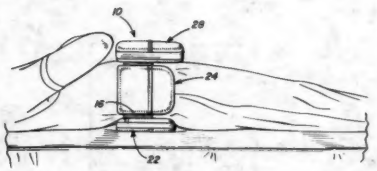
1. A wrench assembly for a compression screw assembly comprising a driving member for releasably engaging a lag screw in axial alignment therewith, said driving member being capable of rotating the lag screw when engaged therewith; and being adapted to have a means slidably mounted thereon having surface contours complementary with a first engaging means formed on the lag screw and a second engaging means formed on the inner surface of a barrel member of a compression plate for being optionally insertable into the barrel member to prevent axial rotation of the lag screw with respect to the barrel member.

4,616,639

ORTHOPEDIC BELT WITH LEG SUPPORTS

William C. Huber, 3751 E. Fairway Dr., Birmingham, Ala. 35213

Filed Jan. 10, 1984, Ser. No. 570,072
Int. Cl.[4] A61F *13/00*
U.S. Cl. 128—99 **12 Claims**



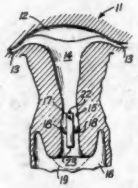
1. Apparatus for use in decreasing stresses and pressures to a person's lower back, the apparatus comprising a waist-embracing belt, at least one cushioning pad associated with the belt for strategic positioning between the wearer and a support surface, so as to provide lower back support, and a pair of support pad assemblies for attachment to the wearer's legs between the knee and ankle, for providing support thereto when the wearer is lying supine, prone and on the side, wherein each leg support assembly comprises a first support pad for positioning against the wearer's calf, a second support pad for positioning against the shin, and tie means attaching the pads together around the wearer's leg.

4,616,640

BIRTH CONTROL METHOD AND DEVICE EMPLOYING ELECTRIC FORCES

Steven Kaali, Penthouse E, 225 E. 63rd St., New York, N.Y. 10021; Peter M. Schwolsky, 4101 Cathedral Ave. NW., Washington, D.C. 20016, and Joseph W. Porter, Washington, D.C., assignors to Steven Kaali, New York, N.Y. and Peter M. Schwolsky, Washington, D.C.

Filed Nov. 14, 1983, Ser. No. 551,590
Int. Cl.[4] A61F *5/46*
U.S. Cl. 128—130 44 Claims



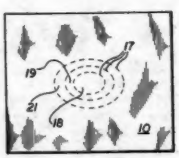
1. The method of birth control which comprises producing an electrical force within and about the cervical canal for preventing migration of male sperm through the cervical canal into the unterine cavity, said method comprising inserting a birth control device formed by a set of spaced-apart opposed low voltage electromotive force producing electrodes within at least the opening to the cervical canal and retaining it in place over extended periods of time and supplying an electromotive force of known voltage across the electrodes from an indepedent source of electric potential.

4,616,641

SURGICAL SHIELD

Edward Teeple, 641 Ridgefield Ave., Pittsburgh, Pa. 15216

Filed Jan. 28, 1985, Ser. No. 695,471
Int. Cl.[4] A61F *13/00*
U.S. Cl. 128—132 R 6 Claims



1. A surgical shield for use during laser procedures comprising:

a. a fabric inner sheet

b. first metallic foil sheets respectively positioned over each side of said fabric inner sheet to coextensively interpose said fabric sheet between said foil sheets; and

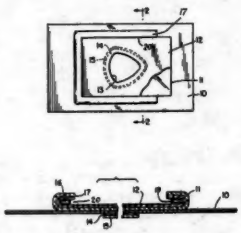
c. means for attaching together the respective foil and fabric sheets about their peripheries, and further wherein said foil sheets and fabric sheet includes at least one bounded perforation for removing the area bounded thereby to expose an operative field.

4,616,642

SURGICAL DRAPE FOR CAESAREAN SECTION

Jeffrey A. Martin, Duluth, and Philip S. Pomeroy, Marietta, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Sep. 4, 1984, Ser. No. 647,289
Int. Cl.[4] A61F *13/00*
U.S. Cl. 128—132 D 15 Claims



1. A surgical drape comprising:

a flexible, nonwoven base sheet having a primary operative area;

a flexible, liquid-imprevious plastic film overlying and secured to one surface of said base sheet in at least a portion of said primary operative area; and

a sheet of first liquid-absorbent material secured to the outer surface of said liquid-imprevious plastic film in at least a portion of said primary operative area, said primary operative area having a region in which said base sheet, said liquid-imprevious plastic film and said first liquid-absorbent material are conextensive, said conextensive region having a fenestration; and

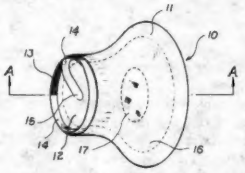
a second liquid-absorbent material located in said primary operative area and having a U-shaped region partially surrounding and spaced from said fenestration, said second liquid-absorbent material having its U-shaped region located within a U-shaped pocket commensurate thereto in shape, said pocket having an opening facing said fenestration and being defined by peripheral edge portions of a laminate of flexible, liquid-imprevious plastic film and liquid-absorbent material.

4,616,643

DISPOSABLE EAR PROTECTOR

Ha Y. Jung, 3436 Carriage Cir., T 1, Randallstown, Md. 21133

Filed Jul. 31, 1985, Ser. No. 760,889
Int. Cl.[4] A41D *21/00*; A61F *11/00*
U.S. Cl. 128—151 3 Claims



1. A disposable ear protecting device comprising:

a cap portion for enclosing the ear, said cap portion provided with an aperture therein,

an adhesive material disposed on the lip of the aperture,

a masking material removably disposed over the adhesive material,

an absorbent pad disposed in said cap, said pad containing a highly moisture absorbent portion located in the central

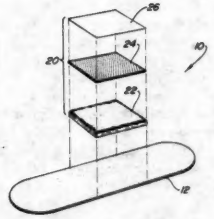
position thereof and adapted to be positioned adjacent to and correspond in size to the hole in the ear.

4,616,644

HEMOSTATIC ADHESIVE BANDAGE

Lowell Saferstein, Edison; Julius A. Lindquist, Bridgewater, and Stephen J. Wolf, Manville, all of N.J., assignors to Johnson & Johnson Products, Inc., New Brunswick, N.J.

Filed Jun. 14, 1985, Ser. No. 744,829
Int. Cl.[4] A61L *15/00*
U.S. Cl. 128—156 **10 Claims**



1. In an adhesive bandage of the type used on minor cuts and wounds, which consists of a pressure-sensitive adhesive coated backing having attached thereto an absorbent pad bandage portion covered with a perforated plastic film wound release cover, the improvement comprising:

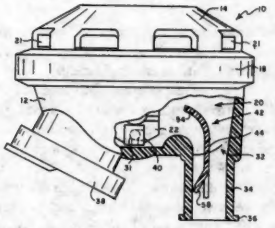
a very thin coating comprising a polyethylene oxide having a molecular weight of at least 600,000, on said wound release cover, thereby to improve the hemostatic effect of said adhesive bandage.

4,616,645

DIVING REGULATOR WITH ANTI FREE-FLOW VANE

Vernon G. Pedersen, Chicago, and Michael Martin, Des Plaines, both of Ill., assignors to Dacor Corporation, Northfield, Ill.

Filed May 24, 1985, Ser. No. 737,497
Int. Cl.[4] A62B *7/04*
U.S. Cl. 128—204.26 **8 Claims**



1. A demand regulator for use with underwater breathing apparatus comprising:

a housing,

a flexible diaphragm extending across the housing to provide a breathing chamber within said housing,

a mouthpiece tube communicating with the breathing chamber through a breathing port provided in a wall of the housing,

an inlet valve connected to a supply of pressurized air and having an orifice for discharging a stream of air into said breathing chamber in proximity to said breathing port,

a partition wall extending across the mouthpiece tube for dividing the tube into at least two passageways,

a first air deflection member extending into said breathing chamber for deflecting the stream of pressurized air from said orifice into a first one of said mouthpiece tube passageways, and

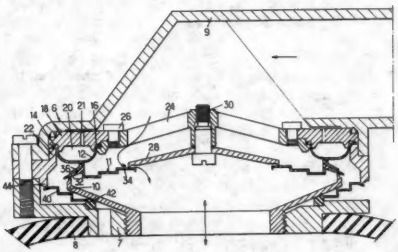
a second air deflection member extending partially across said first passageway for applying back pressure to said stream of pressurized air within said first one of said mouthpiece tube passageways.

4,616,646

COMPENSATED VALVE FOR BREATHING SYSTEM

Raymond Beaussant, Bretigny, France, assignor to Intertechnique, France

Filed Mar. 13, 1985, Ser. No. 711,169
Claims priority, application France, Mar. 14, 1985, 84 03945
Int. Cl.[4] A62B *9/02*
U.S. Cl. 128—205.24 **10 Claims**



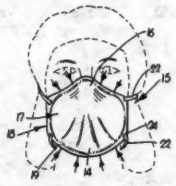
1. A compensated inhalation/exhalation valve comprising a housing, an exhalation seat in said housing, and a deformable one-part diaphragm having a rotational symmetry about an axis of said exhalation seat, wherein said diaphragm has a cup, a substantially radial lip seal integral with a bottom wall of said cup and cooperating with said exhalation valve and wherein said cup has an annular shape and defines with said housing a tore-shaped chamber for connection to a compensation pressure.

4,616,647

MOLDED FIBER DISPOSABLE FACE MASK HAVING ENHANCED NOSE AND CHIN FILTER-SEALS

John B. McCreadie, Shawnee, Kans., assignor to Parmelee Industries, Inc., Kansas City, Mo.

Filed Aug. 13, 1984, Ser. No. 635,632
Int. Cl.[4] A62B *7/00*
U.S. Cl. 128—206.19 **2 Claims**



1. In a disposable face mask adapted to filter air breathed by a user through either his nostrils or mouth, said mask being fabricated of integral porous sheet material molded to a configuration adapted to fit over the wearer's mouth and under his chin with an upper narrowed, channel-defining segment configured to accommodate the wearer's nose, the peripheral edge of the mask being of generally keyhole shaped configuration with the narrow channel segment terminating in an inverted

V-edge which is adapted to fit over the bridge of the user's nose and complementally engage the wearer's cheeks on each side of his nose, the remaining peripheral edge of the mask being of generally semicircular shape and adapted to complementally fit against the wearer's face along the sides of his cheeks and beneath his chin, the improvement of which comprises:

a generally U-shaped region integral with the interior of the channel-defining segment of the mask adjacent the periphery of said V-edge and having opposed, elongated, outwardly diverging legs presenting permeable nose filter-seals adapted to contact the wearer's nose on opposite sides thereof and provide a seal against leakage of air between the nose filter-seal and the face of the wearer,

said nose filter seals being of substantially the same thickness as the remaining inward areas of the mask and presenting generally planar elongated surface portions configured to lie in flat engagement with the wearer's face across the transverse width of each of the nose filter-seals when the latter are in normal compression against the wearer's face; and

a U-shaped area of the channel-defining segment inboard of the U-shaped region thereof being compressed to a degree greater than the compression of said nose filter-seals when the latter are in normal compression against the wearer's face to define a U-shaped groove complemental with said U-shaped region and having leg portions and separating said nose filter seal portions from the remaining inwardly lying areas of the mask, each of said nose filter-seals having an inboard edge defining an outboard side of the respective leg section of said groove, said leg sections of the groove terminating in proximal relationship to the outer terminal ends of the nose filter-seal leg portions and defining opposed, diverging passageways open to the interior of the mask when the latter is fitted in place over the wearer's face for the discharge of air flowing through said nose filter-seal portions toward the wearer's nose and mouth, the remaining portions of said channel-defining segment inboard of said U-shaped region spaced from the wearer's face a distance such that when said mask is fitted to the wearer air may flow freely through said nose filter seals at any path transverse to the entire length thereof and travel along an unobstructed path transverse to respective longitudinal axes of said nose filter-seals and directly to the wearer's nose,

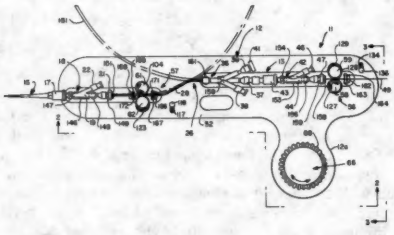
said groove-defining U-shaped area of the channel-defining segment being cooperable with said nose filter-seal leg portions to maintain the normal shape of the mask.

4,616,648

DEVICE FACILITATING THE EXCHANGE OF DILATATION CATHETERS DURING AN ANGIOPLASTY PROCEDURE

John B. Simpson, Woodside, Calif., assignor to Devices for Vascular Intervention, Palo Alto, Calif.

Filed Jan. 8, 1985, Ser. No. 689,656
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—303 R **12 Claims**



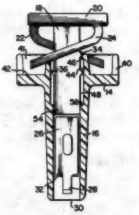
1. In a device facilitating the exchange of dilatation catheters during an angioplasty procedure by the use of an exchange wire in which the exchange wire extends through the dilatation catheter into a predetermined position in a vessel of a patient, first means frictionally engaging the dilatation catheter for advancing or retracting the dilatation catheter, second means frictionally engaging the exchange wire for advancing or retracting the exchange wire, means for causing operation of said first and second friction means in substantial synchronism and causing movement of the dilatation catheter in one direction and the movement of the exchange wire in an opposite direction to form a loop of changing size of the catheter with the exchange wire therein while retaining the distal extremity of the exchange wire and the proximal extremity of the dilatation catheter in predetermined positions during the time that a dilatation catheter is being inserted or being removed from the vessel of the patient.

4,616,649

LANCET

James A. Burns, Elizabeth, N.J., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Sep. 20, 1984, Ser. No. 652,386
Int. Cl.[4] A61B *17/34*
U.S. Cl. 128—314 **9 Claims**



1. A lancet assembly comprising,

(a) an elongated housing;

(b) a passage extending through said housing with a lancet opening at one end thereof;

(c) an elongated lancet body reciprocable in said passage;

(d) a lancet blade positioned in said lancet body at one end thereof;

(e) handle means on said lancet body at the end thereof opposite said lance blade;

the improvement characterized by

(f) a plurality of spaced apart first integral abutment means on said housing and extending into said passage;

(g) a plurality of spaced apart second integral abutment means on said lancet body for cooperating with said first abutment means;

(h) integral resilient means on said handle means and extending between said handle means and said housing;

(i) whereby pushing said handle means causes said body to move through said passage in a first direction making one of said second abutment means to move past one of said first abutment means causing a snap-action in a puncture direction and in turn causing said lancet blade to move through said lance opening;

(j) said pushing first movement compressing said resilient means and damping said snap-action;

(k) said pushing first movement stopped by engagement of one of said second abutment means with one of said first abutment means; and

(l) release of said handle means causing relaxation of said resilient means and movement of said lancet body in said passage in a non-puncture direction until engagement of the other one of said second abutment means with the other one of said first abutment means for maintaining said

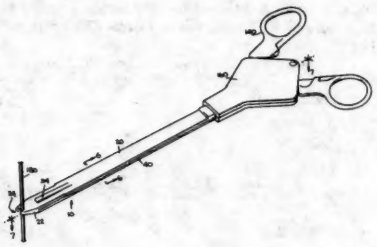
lance blade, within said housing in a non-contaminating position.

4,616,650

APPARATUS FOR APPLYING SURGICAL CLIPS

David T. Green; Richard A. McGarry, both of Norwalk, and Graham Smith, Ridgefield, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Jul. 27, 1984, Ser. No. 635,262
Int. Cl.[4] A61B *17/12*
U.S. Cl. 128—325 13 Claims



1. Apparatus for applying surgical clips one at a time to body tissue, each clip having two legs joined together at a crown, said apparatus comprising:

(a) a proximal portion;

(b) a distal portion having stationary camming surfaces;

(c) means for holding an array of surgical clips, the array having a distal end and a proximal end;

(d) clip closing means for moving between distal and proximal positions and having at the distal end jaw means for (i) receiving the distal-most clip in the array and (ii) then moving towards the distal portion of the apparatus so that the jaw means contact the camming surfaces and close the clip around the body tissue; and

(e) escapement means for (i) placing the distal-most clip of the array in the jaw means when the clip closing means has moved to the proximal position, which is towards the proximal portion of the apparatus, and (ii) preventing any of the other clips in the array from being placed in the jaw means at the same time, wherein the escapement means comprises three pairs of opposing projecting surfaces, which pairs point towards the plane of motion of the clip closing means and are spaced from one another in the longitudinal direction along the apparatus, the proximal-most pair of projecting surfaces extending beyond the middle pair of projecting surfaces in both the lateral and longitudinal directions, the escapement means being held stationary at its proximal end, the rest of the escapement means being able to move toward and away from the plane of motion of the clip closing means and being biased towards the plane, and the proximal-most pair of projecting surfaces resting against the clip closing means when those means are in the proximal position so that the middle and distal-most pair of projecting surfaces are out of the plane of motion of the clip closing means.

4,616,651

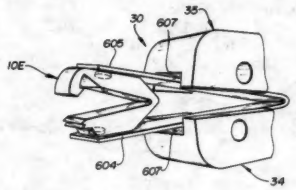
SURGICAL CLIP APPLIER INSTRUMENT ADAPTER JAWS

Donald M. Golden, Cherry Hill, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Division of Ser. No. 723,602, Apr. 15, 1985, Pat. No. 4,570,633, which is a continuation of Ser. No. 306,436, Sep. 28, 1981, abandoned. This application Aug. 22, 1985, Ser. No. 768,532
Int. Cl.[4] A61B *17/12*
U.S. Cl. 128—325 3 Claims

1. In a medical instrument for applying a first type of ligating clip wherein said first type of clip has an extension configuration adapted to be engaged by said instrument and wherein said instrument includes two pivotally connected actuating members, each having on one end a handle and on the other end a jaw for receiving, holding, and applying said first type of clip, each of said jaws defining a channel disposed in confronting relationship with the channel of the other jaw and extending rearwardly from the tip of the jaw, each said jaw including a side wall defining each side wall of the jaw channel, each jaw having a partially cylindrical recess extending across the width of the jaw channel to each jaw side wall, a bore defined through each said jaw side wall in registry with said partially cylindrical recess, the improvement comprising:

an adapter assembly provided with a first and second



adapter member associated with each said jaw, respectively, to accommodate a second type of ligating clip having an extension configuration different than that of said first type of clip;

said first member being releasably secured to the channel in one of said jaws and said second member being releasably secured to the channel in the other of said jaws; each said adapter member being inserted in one of said channels; and

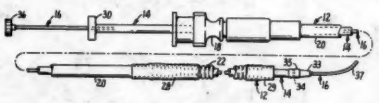
each adapter member including a clip applying means disposed on the portion of the adapter member extending beyond the tip of each jaw member, said applying means being in facing relationship and adapted to receive, hold and apply said second type of clip.

4,616,652

DILATATION CATHETER POSITIONING APPARATUS

John B. Simpson, Palo Alto, Calif., assignor to Advanced Cardiovascular Systems, Inc., Mountain View, Calif.

Filed Oct. 19, 1983, Ser. No. 543,345
Int. Cl.[4] A61M *29/02*
U.S. Cl. 128—344 12 Claims



1. Guiding apparatus for affording introduction of a balloon catheter into a stenosis in a blood vessel which is a branch extending at a substantial angle with respect to a main blood vessel comprising a guide tube having an outside dimension sized for entry into the blood vessel, said guide tube having a wall defining a passage having an inside dimension sized to afford introduction of the balloon catheter therethrough, said guide tube having a distal end and a proximal end, the wall of said guide tube in a zone adjacent the distal end thereof being circumferentially formed so that said guide tube can be curvilinearly disposed in a blood vessel while maintaining said passage in an open condition, an introducer tube having an outside dimension sized for entry into the passage in said guide tube, said introducer tube having an axial extent greater than said guide tube and having a distal end, said introducer tube having a centrally disposed lumen extending axially thereof, and a

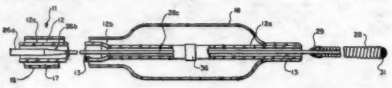
bendable aiming wire having a length greater than said introducer tube and disposed in said lumen for axial telescoping movement relative to said introducer tube, said introducer tube being telescopically movable within said guide tube passage and being removable therefrom to permit introduction of a balloon catheter through said passage, said aiming wire being adapted to be introduced into the branch blood vessel so that the introducer tube can follow the aiming wire into the branch blood vessel and the guide tube can follow the introducer tube.

4,616,653

BALLOON DILATATION CATHETER WITH ADVANCEABLE NON-REMOVABLE GUIDE WIRE

Wilfred J. Samson, Saratoga, and Jeffrey S. Frisbie, San Jose, both of Calif., assignors to Advanced Cardiovascular Systems, Inc., Mountain View, Calif.

Filed Jul. 30, 1985, Ser. No. 760,397
Int. Cl.[4] A61M *25/00*
U.S. Cl. 128—344 **7 Claims**



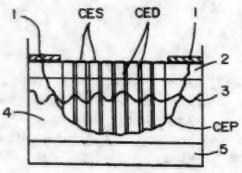
1. In a balloon dilatation catheter with an advanceable non-removable guide wire, a flexible tubular member having first and second lumens extending therethrough, an inflatable balloon carried by the distal extremity of the tubular member so that the first lumen extends through the balloon and is out of communication with the interior of the balloon and in which the second lumen is in communication with the interior of the balloon and a guide wire slidably mounted in the first lumen, a coil-like tip secured to the distal portion of the guide wire and having a cross-sectional area which is greater than that of the cross-sectional area of the first lumen and preventing removal of the guide wire through the first lumen, said guide wire being capable of being advanced longitudinally of the first lumen so that the coil-like tip of the guide wire can be advanced ahead of the balloon to facilitate the positioning of the balloon.

4,616,654

FIELD PRODUCING INSTRUMENT FOR THE ELECTROTHERAPEUTIC SELF-TREATMENT OF PAIN AND INSOMNIA

Luciano Bacchelli, 4, rue d'Orzival, Sierre Vallese, Switzerland

Filed Oct. 9, 1984, Ser. No. 658,861
Claims priority, application Italy, Oct. 18, 1983, 12019 A/83
Int. Cl.[4] A61N *1/20*
U.S. Cl. 128—391 **7 Claims**



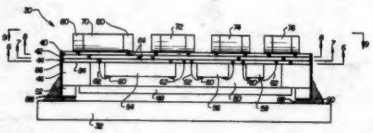
1. Field producing instrument for the electrotherapeutic self-treatment of pain and insomnia, comprising: a supporting body having a sealing element made of insulating material, and providing a compact instrument configuration, a first pair of metal electrodes supported by said sealing element at opposite extremities thereof, a second metal electrode, insulated from the said first pair of metal electrodes, and disposed centrally of said sealing element and between said first pair of metal electrodes, wherein the said second electrode is made of a metal different from that of the said first pair of metal electrodes; and a microbattery having a first pole electrically connected with said first pair of metal electrodes and having a second pole electrically connected with said second metal electrode; said supporting body having a receptacle therein for the housing of said microbattery.

4,616,655

IMPLANTABLE PULSE GENERATOR HAVING A SINGLE PRINTED CIRCUIT BOARD AND A CHIP CARRIER

Alvin H. Weinberg, Miami, and W. Kinzy Jones, Pembroke Pines, both of Fla., assignors to Cordis Corporation, Miami, Fla.

Filed Jan. 20, 1984, Ser. No. 572,310
Int. Cl.[4] A61N *1/00*
U.S. Cl. 128—419 P **9 Claims**



1. An implantable pulse generator comprising:

a human implantable sealed housing of biocompatible material and containing a power supply and a pulse generator circuit powered by said supply for supplying pulses, said circuit including a plurality of semiconductor chips including active chips and passive chips, a single printed circuit mother board for carrying said chips, and chip carrier means mounted on said mother board and carrying said semiconductor chips wherein said carrier means includes:

a unitized body comprised of a plurality of ceramic layers fused together, said body having oppositely facing major surfaces, a cavity disposed in only a first of said major surface housing a plurality of said active chips and a lid member covering and sealing said cavity,

the second of said major surfaces having a plurality of conductive mounting pads thereon electrically receiving and mounting said passive chips thereto whereby said passive chips are mounted on one of said major surfaces and said active chips are mounted and carried in said cavity in the other of said major surfaces.

4,616,656

SELF-ACTUATING BREAST LESION PROBE AND METHOD OF USING

James E. Nicholson, 14 Meadowdam Rd., Lincoln, Mass. 01773, and Roland F. Gatturna, 169 Kendall St., Walpole, Mass. 02081

Filed Mar. 19, 1985, Ser. No. 713,613
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—630 **20 Claims**

5. A probe unit adapted for location of a lesion, and especially for location of a presymptomatic, non-palpable breast lesion, comprising:

(A) a tubular needle cannula adapted for insertion into a body to the site of said lesion;

(B) a probe wire in the form of a simple straight wire closely fitted within, and freely slidable through, said cannula;

(C) said probe wire possessing a memory hook shape at its distal end whereby such end assumes the straight configuration of the cannula when sheathed therein and being dimensioned so as to pierce the body tissue while simultaneously assuming its normal hook configuration when pushed through the cannula to thereby anchor itself in the tissue at the lesion when the probe unit of cannula and probe wire therein has previously been inserted into the body at about the lesion site;

(D) said probe wire possessing the further characteristic of a predetermined degree of soft flexibility whereby said wire is adapted to be manually actuated to release and easily slide from a said anchored location to a fully sheathed disposition within the cannula and without undue destruction of surrounding tissue;

(E) whereby the probe unit may be relocated within the body and the probe wire reanchored within the tissue until a desired accuracy is attained with respect to lesion location; and

(F) the cannula needle being completely withdrawable from the body and operative association with the probe wire.

4,616,657

DIAPHANOSCOPY APPARATUS

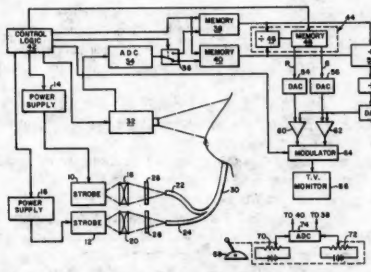
Milton Stoller, West Hartford, Conn., assignor to The First National Bank of Boston, Boston, Mass.

Continuation of Ser. No. 399,865, Jul. 19, 1982, abandoned. This application Jun. 15, 1984, Ser. No. 621,194

The portion of the term of this patent subsequent to Aug. 28, 2001, has been disclaimed.

Int. Cl.[4] A61B *6/12*

U.S. Cl. 128—664 **20 Claims**



1. Apparatus for the non-invasive and non-destructive examination of tissue comprising:

means for illuminating the tissue to be examined with pulses of light, the light pulses which serially illuminate the tissue exclusively including light having preselected different wavelengths;

detector means for sensing the light which passes through the tissue during illumination thereof, said detector means sequentially generating signals commensurate with the energy content of transilluminated light at least at a first and a second of said preselected wavelengths;

balancing means for adjusting the energy content of the light pulses including light at the first wavelength received by said detector means relative to the energy content of the light pulses including light at the second wavelength received by said detector means;

first memory means coupled to said detector means and said illuminating means for separately recording signals sequentially generated by said detector means and commensurate with light at the first wavelength and the second wavelength which has been received by said detector means;

second memory means for storing display correlated data information commensurate with a plurality of ratios of signals commensurate with light at the said first and second wavelength which may be recorded in said first memory means;

means for reading stored information from said second memory means, said reading means being responsive to at least a pair of said separately recorded signals commensurate with the energy content of the light at the first and second wavelengths which has been sensed by said detector means during illumination of the same point in the tissue under examination, said display correlated data information thereby being read from said second memory means as a function of a pair of signals separately recorded in said first memory means; and

means responsive to the information read from said second memory means for producing an image which represents the absorption characteristics of the tissue at the first and second wavelengths.

4,616,658

NON-RADIOACTIVELY LABELED MICROSPHERES AND USE OF SAME TO MEASURE BLOOD FLOW

William Shell, 435 North Roxbury Dr., Beverly Hills, Calif. 90210, and Jackie R. See, 541 Riveria Ct., Fullerton, Calif. 92635

Filed Feb. 27, 1985, Ser. No. 706,151

Int. Cl.[4] A61B *5/02*

U.S. Cl. 128—691 **29 Claims**

1. A process for measuring blood flow in an animal comprising the steps of:

(a) non-radioactively labeling microspheres;

(b) introducing said labeled microspheres into the blood stream of an experimental animal;

(c) determining the number of microspheres in a known volume of said animal's blood after introduction;

(d) sacrificing said animal and recovering a portion of said animal's tissue;

(e) determining the number of microspheres present in a known sample size of said tissue;

(f) calculating blood flow to said tissue from the results of said determination.

4,616,659

HEART RATE DETECTION UTILIZING AUTOREGRESSIVE ANALYSIS

Dimitrios P. Prezas, Park Ridge, and Gustavus H. Zimmerman, III, Westmont, both of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 6, 1985, Ser. No. 730,486

Int. Cl.[4] A61B *5/04*

U.S. Cl. 128—706 **14 Claims**

1. A detection system for determining the cardiac cyclic rate by detecting a predetermined component of the cardiac cycle, comprising:

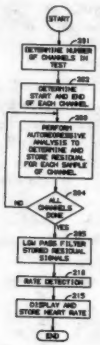
means for obtaining cardiac signals defining a plurality of cardiac cycles;

means for performing an autoregressive analysis filtering of said cardiac signals to remove color noise;

means for executing a low-pass filtering of the autoregressive filtered signals to remove white noise;

means for peak detecting the low-pass filtered signals to

detect said predetermined component thereby determining said cyclic rate; and


START
DETERMINE NUMBER OF CHANNELS IN TEST
DETERMINE START AND END OF EACH CHANNEL
PERFORM AUTOREGRESSIVE ANALYSIS TO DETERMINE AND STORE RESIDUAL FOR EACH SAMPLE OF CHANNEL
ALL CHANNELS DONE
NO
YES
LOW PASS FILTER STORED RESIDUAL SIGNALS
RATE DETECTION
DISPLAY AND STORE HEART RATE
END

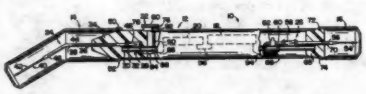
means for displaying said cyclic rate in response to the detection of each predetermined component.

4,616,660

VARIABLE ALTERNATING CURRENT OUTPUT NERVE LOCATOR/STIMULATOR

David L. Johns, Clearwater, Fla., assignor to Suncoast Medical Manufacturing, Inc., Clearwater, Fla.

Filed Dec. 10, 1984, Ser. No. 680,007
Int. Cl.[4] A61B *15/05*
U.S. Cl. 128—741 **1 Claim**



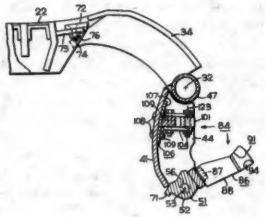
1. A variable alternating current output nerve locator/-stimulator comprising a hollow enclosure which houses a direct current power source electrically coupled to a current power convertor, said current power convertor including circuit means to convert direct current to alternating current electrically coupled to a current regulator, a nerve probe electrically coupled to said current regulator and a ground electrically coupled to said direct current power source, said ground comprising a ground element partially encased within an insulating element and a retainer element extending from said ground element operatively receivable including an aperture disposed within said hollow enclosure said aperture receiving said retainer element therein selectively retaining said ground within said hollow enclosure, a removable nerve probe cover and a removable ground cover removably attached to opposite ends of said hollow enclosure, said ground element being electrically coupled to a flexible insulated conductor electrically connected to said voltage source, said conductor permitting selective withdrawal of said ground element and a desired portion of said flexible insulated conductor from said hollow enclosure when said removable ground cover is removed from said hollow enclosure and application of said nerve probe to the patient after adjustment of said current regulator to control the alternating current output from said direct current power source when said removable nerve probe cover is removed from said hollow enclosure.

4,616,661

ROCK DOOR LATCH WITH OPPOSED ROLLER DETENTS

Roger D. Hanaway, Blue Spring, and Randall E. Breyer, Independence, both of Mo., assignors to Deutz-Allis Corporation, Milwaukee, Wis.

Filed Jun. 13, 1985, Ser. No. 744,427
Int. Cl.[4] A01F *12/00*
U.S. Cl. 130—27 JT **3 Claims**



1. A harvester having a threshing chamber, a crop inlet to the threshing chamber, a rotatable threshing rotor within the threshing chamber and a concave beneath the rotor having a predetermined threshing clearance with the latter, characterized by

a rock door constituting a portion of a floor of the inlet to the threshing chamber forward of said concave, said rock door including

a main body portion pivotally connected at its front end to the harvester on a first horizontal axis generally parallel to the axis of said threshing rotor and

a lip structure pivotally connected to the rear of the main body portion for pivotal movement about a second horizontal axis generally parallel to said first horizontal axis between a detented operating position in which an edge of said lip structure is in overlapping engagement with the front end of said concave and a tripped position in which said lip structure is disengaged from said concave, and

a latch mechanism carried by said safety door for normally maintaining said lip structure rigid with respect to said body portion including

a finger secured to said lip structure and extending radially in relation to said second horizontal axis and presenting a detent part on its free end having surfaces defining a pair of recesses on axially opposite sides thereof and

a detent mechanism releasably maintaining said finger in a predetermined latched position including

a pair of rollers having round outer rolling surfaces engaging said surfaces defining said recesses, respectively, and

resilient thrust transmitting means on said main body urging said rollers into engagement with said recesses.

4,616,662

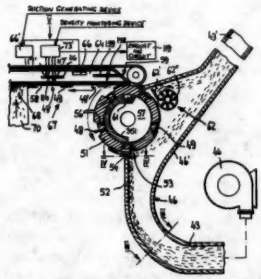
METHOD AND APPARATUS FOR PRODUCING A ROD-SHAPED FILLER FROM SEVERAL TYPES OF SMOKABLE MATERIAL

Werner Hartmann, Hamburg; Gottfried Hoffmann, Schwarzenbek, and Joachim Reuland, Neu Börnsen, all of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Jun. 20, 1984, Ser. No. 622,680
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1983, 3323357; Oct. 6, 1983, 3336293
Int. Cl.[4] A24C *5/18*
U.S. Cl. 131—84.1 **40 Claims**

1. A method of producing a continuous rod-like filler of fibrous material, especially a tobacco filler, comprising the

steps of accumulating fibrous material of a first type into a row of spaced apart batches and conveying the row along a predetermined path; delivering fibrous material of a second type onto and/or into the spaces between the batches of the row so that the two types of fibrous material together form a rod-like filler; generating first signals which are indicative of at least one parameter of the batches in said path; converting the first



signals into first control signals; utilizing the first control signals to influence at least one parameter of the batches; monitoring at least one parameter of the filler; generating second signals which are indicative of such parameter of the filler; converting the second signals into second control signals; and utilizing the second control signals to influence at least one parameter of the filler.

4,616,663

METHOD AND APPARATUS FOR FORMING A HOMOGENEOUS MASS OF COMMINUTED SMOKABLE MATERIAL

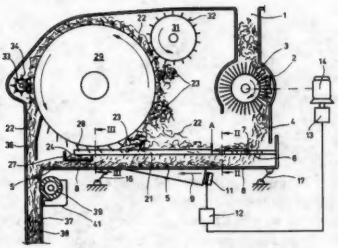
Heinz-Christen Lorenzen, Wentorf; Uwe Heitmann, Hamburg, and Wolfgang Steiniger, Börnsen, all of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Oct. 29, 1984, Ser. No. 666,189

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1983, 3339588

Int. Cl.[4] A24C *5/39*

U.S. Cl. 131—109.3 **25 Claims**



1. A method of forming a homogeneous mass from an agglomeration of tobacco and/or other smokable material including short, medium long and long shreds as well as lumps of shreds and elongated relatively rigid constituents, such as portions of tobacco ribs, comprising the steps of sifting the agglomeration to thereby separate short and medium long shreds from long shreds, lumps and rigid constituents; imparting to the rigid constituents a predetermined orientation; segregating the long shreds and the lumps from the thus oriented rigid constituents; and merging the thus segregated long shreds and the shreds of the lumps with the short and medium long shreds.

4,616,664

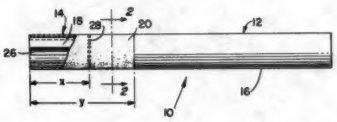
TOBACCO PRODUCT

Richard D. Chumney, Jr., Mechanicsville, Va., assignor to American Brands, Inc., New York, N.Y.

Filed Mar. 17, 1981, Ser. No. 244,729

Int. Cl.[4] A24D *3/64*

U.S. Cl. 131—336 **29 Claims**



28. A smoke filter for a tobacco product including a filter element comprising:

(a) a smoke pervious filter rod having first and second longitudinally spaced ends, one of said ends being adapted to be connected to said tobacco product;

(b) smoke-impervious rod wrap means wrapped about said filter rod, said rod wrap means being recessed into said filter rod to define at least one continuous grooved portion of said rod wrap means extending from said first end to said second end whereby a portion of smoke from said tobacco product enters said continuous grooved portion and moves from said one end toward said other end of said filter rod; and

(c) tipping means disposed about said rod wrap means to cover said grooved portion, said tipping means being made of material which is impervious to smoke, said tipping means including ventilation means for providing gas flow communication between said grooved portion and ambient air whereby said ambient air mixes and commingles with said portion of smoke from said tobacco product entering said continuous grooved portion.

4,616,665

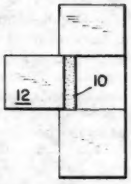
LIGHTING DEVICE FOR CIGARETTES

Saeng K. Cho, 1428 Whitburn Ave., Fayetteville, N.C. 28304

Filed Jul. 18, 1983, Ser. No. 514,781

Int. Cl.[4] A24D *1/00, 47/00*

U.S. Cl. 131—351 **11 Claims**



1. A lighting device for cigarettes or the like tobacco products comprising:

substantially cylindrical support means for slidably engaging a tobacco product;

a match means associated with said support means;

a match striking means associated with said support means for lighting a match; and

a movable cover means for covering said match striking means when not in use and being movable to a position for exposing said match striking means said movable cover

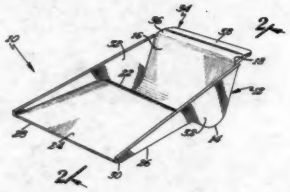
means comprising a perforated portion in said cylindrical support means.

4,616,666

HAIR TREATMENT SOLUTION COLLECTOR

Luigi G. Losenno, 2741 Thomas Ave. South, Minneapolis, Minn. 55416

Filed May 26, 1983, Ser. No. 498,358
Int. Cl.[4] A45D *1/00*
U.S. Cl. 132—9 **4 Claims**



1. Hair treatment solution collector comprising, in combination: a solution catching area having a first side edge, a second side edge, a front edge, and a back edge; a solution introduction ramp having a first side edge, a second side edge, a first edge, and a second, free edge, with the first edge of the solution introduction ramp being connected to the front edge of the solution catching area; a first side wall attached to the first side edge of the solution catching area and the first side edge of the solution introduction ramp; a second side wall attached to the second side edge of the solution catching area and the second side edge of the solution introduction ramp, with the first and second side walls and the solution catching area defining a receiving volume for receiving and storing hair treatment solution, with the second, free edge of the solution introduction ramp being spaced vertically below the back edge of the solution catching area, with the first and second side walls extending generally from the back edge of the solution catching area to a point vertically spaced above the free edge of the solution introducing ramp for forming a treatment solution entrapment portion throughout the length of the solution introduction ramp for preventing solution from flowing over the side edges of the solution introduction ramp, with an obstruction free opening being formed by and defined by the free edge of the solution introduction ramp and the first and second side walls; a handle member attached to the back edge of the solution catching area for grasping by the operator allowing the solution introduction ramp to be placed under a hair curler type device for receipt of hair solution therefrom; and means for supporting the collector on a generally horizontal support surface to prevent escape or spillage of the solution from the receiving volume defined by the solution catching area and the first and second side walls comprising a stand attached to the bottom surface of the solution introduction ramp, with the stand having a first end attached to the front wall of the solution catching area and having a second end spaced from the second, free edge of the solution introduction ramp, and with the stand having a generally horizontal support surface.

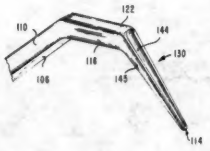
4,616,667

TOOTH CLEANING IMPLEMENT

I. Ping Tang, 606 Union Ave., Elizabeth, N.J. 07208

Filed Oct. 17, 1983, Ser. No. 542,765
Int. Cl.[4] A61C *15/00*
U.S. Cl. 132—89 **6 Claims**

1. A dental instrument for cleaning teeth which comprises: an elongated shaft having an upper end and a lower end, said lower end being provided with a first tapered portion which is tapered to a first tip and which is provided with at least one planar surface thereon, said shaft additionally comprising a linking shaft member at the upper end of said shaft, said linking shaft member being angularly disposed from said shaft; and a head portion which is integrally joined to the upper end of said linking shaft member and which projects angularly therefrom, said head portion having at least one planar surface thereon and being tapered to a second tip, at least one of said planar surfaces in at least one of said first tapered portion and said head portion being further provided with longitudinal groove means for increasing the flexibility and tooth cleaning efficiency of the associated said tip, said first tapered portion and said head portion being each integrally formed from a material selected from the group consisting of a thermoplastic material and a thermosetting material said head portion, said linking shaft member and said shaft being in an angular relation to one another such that said head portion projects outwardly at an angle from 70 to 135 degrees relative to said shaft.

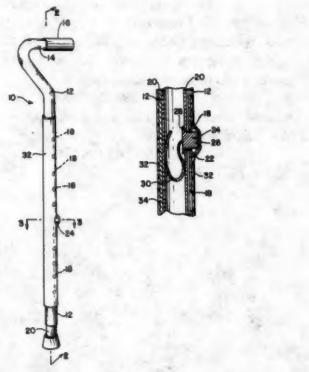


4,616,668

INVALID DEVICE HAVING INTERLOCKING TELESCOPING MEMBERS

Joseph Battiston, Clifton, N.J., assignor to Tubular Fabricators, Industry, Inc., Passaic, N.J.

Filed Oct. 16, 1984, Ser. No. 661,515
Int. Cl.[4] A61H *3/00*; **A45B** *9/00*
U.S. Cl. 135—75 **5 Claims**



1. An arrangement of interlocking telescoping members for an invalid device, comprising:

an outer telescoping member having a plurality of apertures spaced and substantially aligned along the longitudinal direction of said outer telescoping member;

an inner telescoping member telescopically received within said outer telescoping member and having an aperture;

button means engaging with said inner telescoping member and said outer telescoping member by extending through said aperture of said inner telescoping member and a selected aperture of said outer telescoping member, and with an outer end of said button means extending outwardly beyond said selected aperture;

first biasing means for outwardly biasing said button means with a first force to normally bias said outer end of said

button means outwardly beyond said selected aperture; and

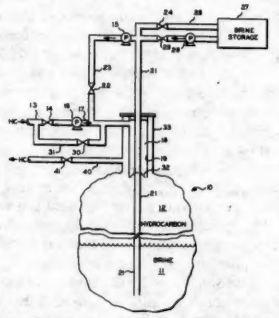
elastic sleeve means tightly surrounding only said outer telescoping member about said plurality of apertures thereof for biasing said button means against the force of said first biasing means, whereby to permit pinch-free depression of said button means to adjust said outer telescoping member with respect to said inner telescoping member and to prevent rattle between said inner telescoping member and said outer telescoping member.

4,616,669

MIXING FLUIDS

Stone P. Washer, and Bruce A. Bush, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 8, 1985, Ser. No. 720,929
Int. Cl.[4] B65G *65/30*
U.S. Cl. 137—1 **11 Claims**



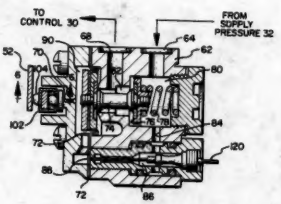
1. A method for mixing stored fluids in an underground storage covern in which said fluids are stored over heavier immiscible fluids comprising admixing said immiscible fluids with said stored fluids by forcing said immiscible fluids from the lower portion of said cavern to the upper portion of said cavern where said immiscible fluid flows through said stored fluids and returns to the lower portion of said cavern.

4,616,670

HIGH-LOW PRESSURE PILOT

John W. Duffy, Tama, Iowa; Robert A. Funke, Anna, Tex., and David W. Shollenbarger, Marshalltown, Iowa, assignors to Fisher Controls International, Inc., Marshalltown, Iowa

Continuation of Ser. No. 459,178, Jan. 19, 1983, abandoned. This application Apr. 22, 1985, Ser. No. 725,147
Int. Cl.[4] G05D *16/00*
U.S. Cl. 137—84 **10 Claims**



1. A pressure pilot monitoring a process fluid pressure and for sensing predetermined high and low fluid pressure set points to control a process shutdown system when the monitored process pressure extends beyond the high or low pressure set points, said pressure pilot comprising:

a frame;

a Bourdon tube mounted on said frame having an input end coupled to the process fluid pressure and a moving output end responding to the process fluid pressure to move in a first direction upon sensing a decreasingly lower pressure and in a second direction upon sensing an increasingly higher pressure;

means mounted on said frame, including a pair of pivot members for setting a respective low pressure set point and a high pressure set point;

a lever arm pivotally mounted to said Bourdon tube moving output end between said pair of pivot members, including means enabling said lever arm to move in said first direction and contact one of said pivot members when the Bourdon tube senses a pressure reaching the low pressure set point and thereby pivoting the lever arm, and enabling the lever arm to move in a second direction and contact the other of said pivot members when the Bourdon tube senses a pressure reaching the preset high pressure set point to thereby pivot the lever arm;

a fluid operated relay mounted on said frame having an inlet port for connection to a fluid pressure line, an outlet port, and a nozzle port, wherein the inlet port is in fluid communication with the outlet port with the nozzle port closed, and wherein the inlet port is blocked from the outlet port with the nozzle port opened;

relay operating cap means responding to engagement with said lever arm for rapdily snap-closing said nozzle port when said sensed fluid pressure is between said low and high pressure set points and for responding to non-engagement with said lever arm for quick release opening of said nozzle port when said sensed fluid pressure has reached either said low or said high pressure set points, thereby providing a pressure level change at the relay outlet port;

said fluid operated relay includes a piston having a piston seal at one end and a diaphragm at the other end, said piston seal being adapted to seal the inlet port from the outlet port with the outlet port being coupled through the inlet port to said pressure line with the nozzle port closed, and the diaphragm having the nozzle port on one diaphragm side and the outlet port on the other diaphragm side, and including means for for developing a higher positive pressure on the outlet port side of the diaphragm than on the nozzle port side of the diaphram in response to unsealing of said nozzle port, thereby providing a positive movement of the diapragm towards the nozzle port and a corresponding rapid, snap-acting sealing of the inlet port from the outlet port by the piston seal; and

said relay operating means includes snap-acting cap means having a self-aligning cap member adapted for self-alignment with said nozzle port upon movement into engagement therewith.

4,616,671

VALVE WITH FLOW FORCE COMPENSATOR

Allan R. Steinkuhl, West Lafayette, and Steven D. Cayton, Lafayette, both of Ind., assignors to TRW Inc., Cleveland, Ohio

Filed Jan. 27, 1984, Ser. No. 574,403
Int. Cl.[4] F15B *13/06*
U.S. Cl. 137—101 **9 Claims**

1. A valve comprising:

a housing having a valve chamber, an inlet communicating with said valve chamber, and at least two outlets communicating with said valve chamber,

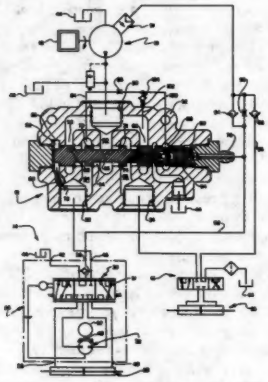
a valve member located in said valve chamber for controlling fluid flow from said inlet to said outlets,

said valve member having a land across which fluid flows from said inlet to one of said outlets, the fluid flow across said land creating a force acting on said valve member urging said valve member in a first direction in which flow

across said valve member to said one of said outlets is restricted,

means for causing a balancing fluid pressure to be applied to said valve member, said balancing fluid pressure urging said valve member in a second direction that is opposite said first direction,

said valve member comprising a spool that can move axially in said valve chamber in response to a differential pressure applied thereto, said differential pressure being created by



a first fluid pressure force applied to a first end of said spool and a second fluid pressure force applied to a second end of said spool and urging said spool in said second direction, said means for causing a balancing pressure to be applied to said valve member including fluid conduit means communicating with the other of said outlets and for directing the balancing fluid pressure to said second end of said spool to increase the fluid pressure force on said second end of said spool.

4,616,672

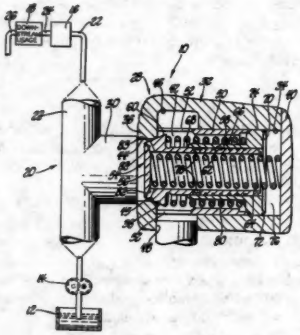
PRESSURE RELIEF AND DRAIN VALVE

Michael R. Schmidt, Carmel, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 27, 1986, Ser. No. 822,653

Int. Cl.[4] F16K *17/34*

U.S. Cl. 137—107 **3 Claims**



1. A pressure relief and drain valve for a fluid circuit having a pressurized fluid selectively circulated therein comprising:

a valve body connected to said circuit and to a sump,

a valve element on said valve body moveable between an open position and a closed position wherein a primary surface area of said valve element is exposed to fluid pressure in said circuit and blocks fluid flow from said circuit to said sump,

said fluid pressure in said circuit exerting a force on said primary surface area in the valve opening direction,

spring means biasing said valve element toward said closed position,

valve seat means on said valve element and said valve body operative to define an annular orifice in said valve element open position through which said fluid flows from said circuit to said sump to relieve circuit pressure,

means on said valve element and on said valve body defining a variable volume secondary chamber,

said valve element having a secondary surface area exposed to said secondary chamber,

means on said valve element primary surface area defining a suction surface over which said fluid flows in said valve element open position,

means on said valve element defining a passage between said suction surface and said secondary chamber whereby said fluid pressure in said circuit exists in said secondary chamber in said valve element closed position so that the net fluid pressure force on said valve element in the valve opening direction is proportional to the difference between said primary and said secondary surface areas,

the flow of fluid over said suction surface in said valve element open position effecting a decrease in pressure in said secondary chamber proportional to the velocity over said suction surface so that the net fluid pressure force on said valve element in the valve opening direction and the depth of said annular orifice increase when the fluid flow velocity increases, and

means on said valve body and said valve element responsive to the pressure of said fluid in said circuit in said valve element closed position to open said secondary chamber to said sump when said fluid circuit is substantially depressurized so that said fluid circuit drains to said sump when said circuit is depressurized.

4,616,673

REPLACEMENT FAUCET HANDLE KIT

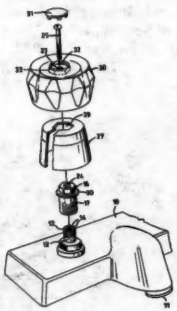
Jerry Bondar, 43 Lissom Crescent, Willowdale, Ontario, Canada M2R 2P2

Continuation of Ser. No. 715,589, Mar. 25, 1985, abandoned, which is a continuation of Ser. No. 422,480, Sep. 23, 1982, abandoned. This application Dec. 6, 1985, Ser. No. 805,266

Claims priority, application Canada, May 21, 1982, 403591

Int. Cl.[4] F16K *31/60*

U.S. Cl. 137—315 **3 Claims**



1. In combination a replacement faucet handle for replacing an original faucet handle, a skirt member having an opening therein, a plurality of adapters each having a first end portion adapted to be connected to the replacement faucet handle, a

second end portion adapted to be connected to an upper end portion of a faucet valve stem, and an outwardly projecting flange between the first end portion and the second end portion of the adapter, and means permitting securement of the replacement faucet handle and a selected one of the adapters to the upper end portion of the faucet valve stem on which the original faucet handle has been mounted at a predetermined level, the replacement faucet handle having an underface, a concavity in said underface of the handle, and a recess provided in said concavity in said underface of the handle, the first end portions of the adapters being substantially identical and each being of non-circular, transverse cross-sectional configuration complementary to the transverse cross-sectional configuration of the recess in the handle, and the second end portion of each adapter having a bore of non-circular transverse cross-sectional configuration, with the second end portion of each adapter differing from the second end portion of each remaining adapter with respect to at least one characteristic selected from the group of characteristics consisting of the length thereof, the length of the bore therein, and the transverse cross-sectional dimensions of the bore therein, the length and transverse cross-sectional configuration and dimensions of the bore in the second end portion of said selected one of the adapters being complementary to the length and transverse cross-sectional configuration and dimensions of the upper end portion of the faucet valve stem, whereby said selected one of the adapters is adapted to be non-rotatably mounted on the upper end portion of the faucet valve stem by disposing the upper end portion of said faucet valve stem within said bore in the second end portion of said selected one of the adapters, and the replacement faucet handle is adapted to be non-rotatably mounted on said selected one of the adapters by disposing only the first end portion of said selected one of the adapters through the opening in the skirt member and within the recess in the replacement faucet handle, with the skirt member disposed within the concavity in the underface of the handle, the replacement faucet handle and said selected one of the adapters being securable to the upper end portion of the faucet valve stem with the skirt member securely clamped in the concavity in the underface of the replacement faucet handle by the outwardly projecting flange of said selected one of the adapters, wherein the length of said second end portion of said selected adapter is such that when the replacement faucet handle and said selected adapter are secured to the upper end portion of the faucet valve stem the replacement faucet handle is positioned at substantially said predetermined level at which the original faucet handle has been mounted on the upper end portion of the faucet valve stem.

4,616,674
4/3-DIRECTIONAL CONTROL VALVE

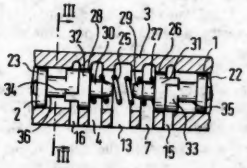
Meinrad Bardoll, Gaggenau, Fed. Rep. of Germany, assignor to Dr.Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 31, 1984, Ser. No. 646,250

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1983, 3331582

Int. Cl.[4] F15B *15/00*

U.S. Cl. 137—596.18 **6 Claims**



1. A 4/3-directional control valve for the control of a hydraulic piston of a hydraulic shifting mechanism, comprising: control piston means biased by a coil spring in a nonactuating position, tubularly shaped housing means, said control piston means being longitudinally guided in said housing means, said housing means having working connections connected to the hydraulic piston, pump connections connected with a pump and a return connection connected with a reservoir tank, said control piston means including two oppositely operating control pistons guided within said valve housing means, said control pistons having first end forces facing one another and second end faces away from one another said spring disposed between said first end faces, said return connection having a port opening centrally within said housing said pump connections having port openings axially disposed on either side of said return port opening said pump connections having port openings disposed between said return opening and said pump openings said control piston means having surface means blocking communication between said working openings and said pump openings in said non actuating position while said working openings and said return opening communicate with one another wherein said hydraulic pistons can operate to pass fluid from one side of its piston to its other side via said working connectons and said working openings, means for acting on said second end faces to move said control piston means for locating said surface means to block communicating between one of said working port openings and said return port opening wherein said one of said working port openings communicates with one of said pump openings.

4,616,675
SOLENOID-ACTUATED DIRECTIONAL CONTROL VALVE

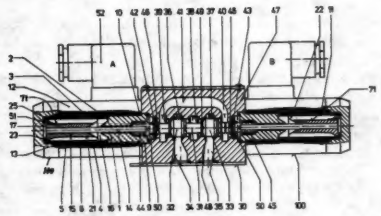
Reinhard Amrhein, Frammersbach, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Feb. 22, 1985, Ser. No. 704,542

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1984, 3406570

Int. Cl.[4] F16K *47/00*

U.S. Cl. 137—625.65 **7 Claims**



1. A three chamber solenoid-actuated directional control valve comprising:

a valve housing having a bore extending longitudinally therethrough;

a spool having at least one land thereon reciprocally mounted within said bore and defining with said housing, between first and second ends of said spool, three chambers, a first chamber being adapted to be connected to a pump for supplying hydraulic fluid, a second chamber being adapted to be connected to a first load and a third chamber being adapted to be connected to a second load and defining with said housing at least one recess adapted for connection to a tank and located between one of said ends and said chambers;

throttle means on said at least one land between at least one chamber and said recess;

solenoid means in said spool including a solenoid housing having an inner bore surface defining a bore extending therethrough along said bore direction from said one end

of said spool, an armature reciprocally mounted for longitudinal movement along said bore direction in response to actuation of said solenoid means, and an actuating rod fixedly mounted to said armature for actuating said spool when said solenoid means is actuated, a space being defined between the end of said armature remote from said spool and said valve housing and at least one armature groove being formed between the outer surface of said armature and said inner bore surface of said solenoid housing and connected to said recess; and

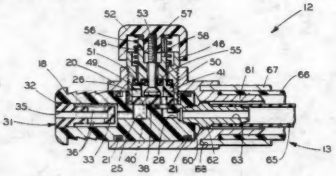
motion damping means including at least a single cross wall between said space and said groove adjacent said remote armature end and having a throttling groove between said cross wall and said inner bore surface for dampening movement of said armature to reduce pressure peaks during switching.

4,616,676

TWO-WAY SELECTOR VALVE FOR A VEHICLE SEAT INFLATION DEVICE

Norman R. Adams, Angola, Ind., and Charles A. Gifford, Osseo, Mich., assignors to Cooper Tire & Rubber Company, Auburn, Ind.

Filed Jul. 27, 1984, Ser. No. 634,959
Int. Cl.[4] F16K *11/18*
U.S. Cl. 137—636.4 **28 Claims**



21. A two-way selector valve adapted to selectively provide communication between a means for selectively supplying pressurized fluid, first and second pneumatic chambers, and the atmosphere comprising:

a first passageway in communication with the means for selectively supplying pressurized fluid and with a valve chamber;

a second passageway in communication with the first pneumatic chamber;

a third passageway in communication with the second pneumatic chamber;

rotatable valve plate means disposed in said valve chamber for providing communication between said valve chamber and a selected one of said second and third passageways; and

relief valve means mounted for rotation with said valve plate means and movable relative thereto for selectively providing communication between said valve chamber and the atmosphere to deflate the selected chamber.

4,616,677

MANIFOLD FITTING FOR A COMPRESSED AIR TANK

Joseph L. Krechel, Ladue, and Michael J. Purvis, Fenton, both of Mo., assignors to Control Devices, Incorporated, St. Louis, Mo.

Continuation of Ser. No. 474,806, Mar. 14, 1983, abandoned. This application Apr. 15, 1985, Ser. No. 723,135
Int. Cl.[4] F16K *11/10*
U.S. Cl. 137—881 **5 Claims**

1. A manifold fitting for a compressed air tank comprising:

an elongate main body of hexagonal cross-section with first and second ends of reduced circular cross-section;

said body having an axial passage therethrough from one end to the other;

said first end being externally threaded for attachment of the fitting to a tank for communication with the tank via the portion of the axial passage in said first reduced end;

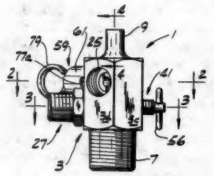
said body having a first lateral opening extending inwardly to said axial passage from a first face of the six faces of the body;

an outlet member threaded in said first lateral opening in the body having a valve seat at its inner end toward said passage;

said second reduced end being adapted for passage of air via the portion of said axial passage therein;

said body having a second lateral opening extending inwardly to said passage from a second of the six faces of the body opposite said first face, said second lateral opening being opposite said first lateral opening and in axial alignment therewith;

a valve member threaded in said second lateral opening extending across said passage with space around said valve member for flow of air, said valve member being



adapted to be threaded inwardly in said second lateral opening for engagement of its inner end with the valve seat and to be threaded outwardly with respect to said second lateral opening to an open position for flow of air from the tank through said passage and through said outlet member;

said body having a third lateral opening extending inwardly from a third of said six faces to said passage;

a pressure relief safety valve comprising a valve body threaded at one end constituting its inner end in said third lateral opening in the body, a vent port in the valve body, a valve member movable in the valve body from a closed position blocking said port to an open position for escape of air through the port, and spring means for biasing the valve member to its closed position; and

said body having a fourth threaded lateral opening extending inwardly from a fourth of said faces to said passage for receiving a pressure gauge.

4,616,678

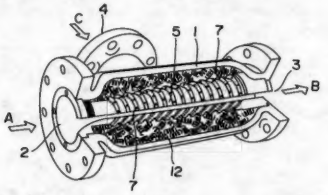
MEANS FOR PREVENTING WATER HAMMER IN FLUID-FEEDING SYSTEM

Mitsuo Hoshi, Tokyo, Japan, assignor to Hokuto MFG, Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1985, Ser. No. 771,026
Claims priority, application Japan, Jun. 6, 1985, 60-123107
Int. Cl.[4] F16K *19/00*
U.S. Cl. 137—888 **2 Claims**

1. In an apparatus for preventing water hammer in a fluid-feeding system having a jet mixer therein, said jet mixer comprising a surrounding casing having an inlet and an outlet for fluid flowing in said system and a supply port for supplying a gaseous or fluid material to be mixed into said system, and a venturi-type jet tube interposed between and fixed to said inlet and said outlet and having a plurality of jets at the periphery thereof, the improvement comprising a group of a plurality of

discreet spring-shaped elements made of materials which are compatable to the properties of said material to be mixed, said



elements being uniformly disposed within a chamber defined between said jet tube and the surrounding casing.

4,616,679

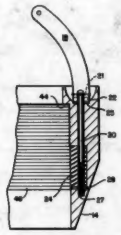
PIPE THREAD PROTECTOR

Jerry A. Benton, 26 Amarillo Dr., Houma, La. 70360

Filed May 31, 1985, Ser. No. 739,685

Int. Cl.[4] F16L *57/00*; B65D *59/00*

U.S. Cl. 138—96 T **6 Claims**



1. A device for protecting the threads of a threaded pipe section comprising: a cylindrical member having interior and exterior side walls and with end walls at opposite ends of said side walls, said interior side wall having a recessed portion therein, said cylindrical member defining an opening for receiving a section of pipe; and means for forming a friction grip between said cylindrical member and the outer wall of a pipe section received by said cylindrical member, said friction grip means providing for said pipe section to be open across the entire diameter of said pipe section throughout the length thereof and to allow the pipe section to be drifted without obstruction, said friction grip means including a compressible member mounted in said recessed portion of said interior side wall, said compressible member, when compressed by a force applied in a direction generally parallel to the longitudinal axis of said cylindrical member, expanding laterally to extend radially inwardly of said interior side wall, a compression plate secured to said compressible member, said compression plate being disposed in a plane generally perpendicular to the longitudinal axis of said cylindrical member, a compression shaft mounted within said cylindrical member between the interior and exterior side walls and extending in a direction generally parallel to the longitudinal axis of said cylindrical member, said compression shaft having one end thereof threadedly received in said compression plate and the other end extending to the exterior of said cylindrical member, and a handle pivotally mounted to the exterior end of said compression shaft, said handle having cam means for moving said compression shaft in a direction generally parallel to the longitudinal axis of said cylindrical member to increase or reduce the degree of compression of said compressible member.

4,616,680

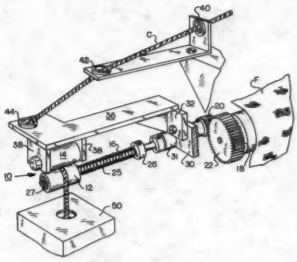
CATCH-CORD DRAWING DEVICE FOR LOOMS

Pepper Y. Lai, Greensboro, N.C., assignor to Draper Corporation, Greensboro, N.C.

Filed Jun. 8, 1984, Ser. No. 618,664

Int. Cl.[4] D03D *49/20*

U.S. Cl. 139—304 **3 Claims**



1. A catch-cord selvage drawing device for use on fluid jet or shuttleless looms of the type wherein the woven fabric is taken off the loom under tension applied by a take-up roll, and wherein a plurality of catch yarns are introduced alongside the fabric sheet and adjacent one selvage thereof to catch and retain the cut ends of inserted weft yarns to form a "catch-cord selvage" thereof; said winding device being for the purpose of removing such catch-cord selvage and comprising:

(a) a pair of cooperating rotating members for nipping said catch-cord therebetween and drawing therethrough; said pair of rotating members including an idler roller and a drive roller; said idler roller and drive roller including smooth outer surfaces for preventing entanglement of the catch-cord as it is being drawn therebetween;

(b) synchronizing means for connecting said drive roller to the fabric take-up mechanism so that the surface speed of said drive roller is the same as the speed of the fabric as the fabric is removed from the loom onto the take-up roll;

(c) said synchronizing means comprising:

(i) a rotating shaft and means for mounting said drive roller thereon;

(ii) a plurality of meshing, interacting gears connecting said rotating shaft and said take-up roll;

(iii) said drive roller being mounted on one end of said rotating shaft in operative relationship with said idler roller; the surface diameter of said drive roller and the gear ratios of said gears being such that the tension on the catch-cord is substantially the same as the tension on the fabric;

whereby the matching of the speeds of the catch-cord drawing device and the fabric take-up roll results in the same tension upon the selvage ends as is on the fabric.

4,616,681

ARRANGEMENT FOR THE SUPERVISION OF WEFT THREADS ON A CIRCULAR LOOM

Franz X. Huemer, Sonnenuhrgasse 4, 1060 Vienna, Austria

Filed May 22, 1985, Ser. No. 736,792

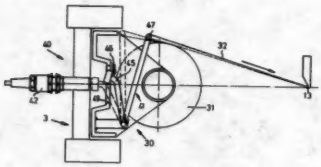
Claims priority, application Switzerland, Jun. 8, 1984, 2798/84

Int. Cl.[4] D03D *37/00, 51/34*

U.S. Cl. 139—371 **10 Claims**

1. In a circular weaving machine having a circular reed in which a traveling shed is formed by warp threads to produce a tubular fabric along an edge of said shed by weft thread paid-off from a bobbin of a shuttle traveling in a circular path in said reed and said shed, the improvement which comprises a weft thread monitoring device comprising:

a tipping lever pivotally mounted on said shuttle and comprising a rod extending parallel to said bobbin and over which the weft thread from said bobbin is paid-out after being at least partially wound about said rod, respective support arms connected to each end of said rod and pivotally mounting said lever on said shuttle, and an actuating arm connected to one of said support arms for swinging movement with said lever toward said reed upon relaxation of a force applied to said rod by said warp thread as it is paid-out from said bobbin into said shed to form said fabric at said edge;



means for generating a restoring force on said tipping lever biasing same in a direction tending to swing said actuating arm toward said reed; and

at least one signal generator disposed along said reed and responsive to the passage of said shuttle when said actuating arm has been swung toward said reed in contactless manner for generating a stop signal to terminate operation of the loom and prevent weft threads faults from being produced in said fabric upon a weft thread failure.

4,616,682

METHOD OF MANUFACTURING HELICALLY WOUND FILAMENTS AND FILAMENTS MANUFACTURED BY MEANS OF THIS METHOD

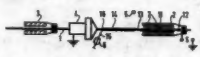
Martinus A. Groenewegen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

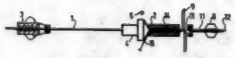
Filed Dec. 13, 1984, Ser. No. 681,471

Claims priority, application Netherlands, Jan. 13, 1984, 8400117

Int. Cl.⁴ B21F *45/00*

U.S. Cl. 140—71.5 **4 Claims**





1. A method of manufacturing helically wound filaments, comprising the steps of winding a filament wire on a mandrel, heating the helically wound wire while holding it on the mandrel so that winding stresses in the wire are eliminated, and drawing the mandrel out of the filament, characterized by:

winding a plurality of filaments from one filament wire, while forming a filament wire portion between each preceding filament and the next subsequent filament, extending substantially longitudinally with respect to the mandrel,

heating said next subsequent filament to eliminate winding stresses therein and in said portion between said next subsequent filament and the preceding filament, while keeping the preceding filament cool and the filament wire extending to said next subsequent filament stretched,

then, while relatively rotating the mandrel and the filaments about their axes in a sense opposite to the winding sense, and holding the next subsequent filament at its last-formed end, drawing the mandrel out of the preceding filament and displacing the mandrel through said next subsequent filament,

interrupting the connection between the preceding filament and said next subsequent filament wire portion at the longitudinal filament wire portion, and

moving the mandrel back beyond the free end of said filament wire portion.

4,616,683

PARTICLE-FREE DOCKABLE INTERFACE FOR INTEGRATED CIRCUIT PROCESSING

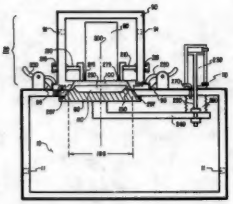
Barclay J. Tullis, Palo Alto; Mihir Parikh, San Jose; David L. Thrasher, Menlo Park, and Mark E. Johnston, Saratoga, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 536,600, Sep. 28, 1983, Pat. No. 4,532,970. This application Apr. 8, 1985, Ser. No. 721,332

The portion of the term of this patent subsequent to Aug. 6, 2002, has been disclaimed.

Int. Cl.⁴ B65B *1/04*

U.S. Cl. 141—98 **4 Claims**



1. An interface between first and second containers comprising:

alignment means for orienting the first container in a fixed position relative to the second container;

a first door for independently sealing the first container;

a second door for independently sealing the second container;

said first and second doors each having a mating outer surface of substantially equal exterior dimensions, so that substantially all contamination which has accumulated on the exterior surface of the doors when the containers are separated will be trapped between said doors when the containers are positioned together with said alignment means; and

elevator means coupled to said doors for transporting said doors into said containers as a single unit while said doors are coupled together at their mating outer surfaces and said doors are held together substantially only by gravity.

4,616,684

AUTOMATIC BOTTLING MACHINE BOTTLE HOLDER

Franco Tincati, Parma, Italy, assignor to SARCMI S.p.A., Noceto, Italy

Filed Feb. 21, 1985, Ser. No. 703,746

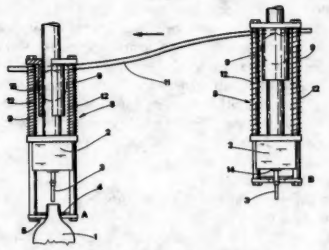
Claims priority, application Italy, Mar. 2, 1984, 40017 A/84

Int. Cl.⁴ B65B *3/04*

U.S. Cl. 141—114 **6 Claims**

1. An automatic bottling machine bottle holder for filling a bottle having a circumferential neck projection on its neck adjacent to its open end comprising; a bottle support means at one end thereof, said bottle support means having an opening therein sized to receive the bottle neck and sized smaller than the circumferential neck projection, to thereby support the

bottle when the neck projections rests thereon; a valve means positioned between said one end and the other end of said holder, said holder being movable with respect to said valve means, said valve means having a filler tube projecting from



one end thereof toward said opening, and said filler tube and said opening being positioned to permit the filler tube to project through said opening when said opening is moved a predetermined distance towards said valve means.

4,616,685

PNEUMATIC TIRE TREAD OF STABLE DYNAMIC PERFORMANCE

Katsuyuki Harakon, 2800-1, Ogawahigashicho, Kodaira City, Tokyo, and Masanori Kawamura, 1293-10, Tateno 3-chome, Yamato City, Tokyo, both of Japan

Filed Sep. 24, 1984, Ser. No. 653,986

Claims priority, application Japan, Sep. 30, 1983, 58-180622

Int. Cl.[4] C08K *5/01, 5/06, 5/51;* C08L *9/06*

U.S. Cl. 152—209 R 3 Claims

1. Pneumatic tire tread of stable dynamic performance comprising a rubber component selected from the group consisting of styrene-rich styrene-butadiene copolymer rubbers containing more than 35% by weight styrene and mixtures of said styrenebutadiene rubbers with at least one of butyl rubber, butyl halide rubber and butadiene-acrylonitrile copolymer rubber, 5 to 60 weight parts of an ester selected from the group consisting of phthalic acid ester, octyl oleate, octyl adipate, glyceric acid ester, maleic acid ester, fumaric acid ester, phosphonic acid ester and phosphoric acid ester and 5 to 300 weight parts of a petroleum-based processing oil together with said ester per 100 weight parts of the rubber.

4,616,686

TIRE CONTAINING IMPROVED LINER

Dominic A. Berta, New Castle County, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 691,334, Jan. 14, 1985. This application Jan. 13, 1986, Ser. No. 818,423

Int. Cl.[4] G60C *5/02, 5/12, 5/14*

U.S. Cl. 152—510 12 Claims

1. In a pneumatic tire having cured rubber liner ply overlying all internal tire surfaces exposed in service to pressurized gas and having, as essential rubbery constituents, (a) (i) halobutyl rubber or (ii) a mixture of butyl rubber and halobutyl rubber wherein the halobutyl rubber is present in an amount of at least 50% by weight of the mixture; and (b) an epihalohydrin rubber, the improvement which comprises curing the rubber liner with a composition consisting essentially of, for each 100 parts by weight of the rubber blend: (a) from about 1.0 part to about 20 parts of a sulfur curative system consisting essentially of (i) sulfur, (ii) an accelerator, and (iii) a zinc oxide promoter; and (b) from about 0.3 part to about 10 parts of a nonsulfur curative system consisting essentially of (i) a nonsulfur curative selected from the group consisting of di- and tri-functional mercapto compounds and derivatives thereof; and (ii) a metal compound promoter selected from the group consisting of oxides, hydroxides, and carbonates of metals in Groups Ia and IIa and said composition cured from about 140° C. to about 260° C. from about 5 seconds to 10 hours.

4,616,687

TIRE CONTAINING IMPROVED LINER

Dominic A. Berta, New Castle County, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 715,326, Mar. 25, 1985. This application Jan. 13, 1986, Ser. No. 818,424

Int. Cl.[4] B60C *5/02, 5/12, 5/14*

U.S. Cl. 152—510 6 Claims

1. In a pneumatic tire, the improvement which consists of a vulcanized rubber liner ply overlying all internal tire surfaces exposed in service to pressurized gas and comprising, as essential rubbery constituents, a composition consisting essentially of:

(a) from about 80% to about 90% of a rubber material selected from the group consisting of butyl rubber, halobutyl rubber having from about 1% to about 3% by weight of halogen, and mixtures thereof; and

(b) from about 1% to about 20% chlorinated hydrocarbon polymer selected from the group consisting of chlorinated polyisoprene having a chlorine content from about 63% to about 66% by weight and chlorinated polyolefins having a chlorine content from about 30% to about 70% by weight.

4,616,688

SIMPLE OR ROTATING TRAVERSERS FOR VERTICAL WINDOW BLINDS

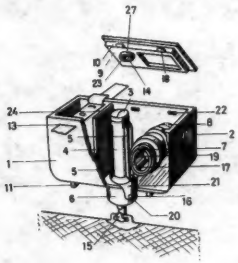
Angel Agos, Vitoria, Spain, assignor to Aryho, S.A., Malago, Spain

Filed Dec. 16, 1983, Ser. No. 562,141

Claims priority, application European Pat. Off., Dec. 21, 1982, 8211192.9

Int. Cl.[4] E06B *9/36*

U.S. Cl. 160—176 R 4 Claims



1. A device to control and protect the operating mechanisms of vertical slats for window blinds actuated from a main shaft comprising

a box for each of the slats containing the mechanism of the device;

a worm gear horizontally mounted in said box and connected to be rotated by the main shaft;

a pinion mounted vertically in said box adjacent to said worm gear;

said pinion including

a hollow external body having a lower portion housed in a vertical position in the bottom of said box,

said lower portion having an annular keyway indented therein with end walls at each end of the keyway,

a projection from the bottom of said box which enters said keyway and limits the rotation of said external body by

contact with said end walls of said keyway to approximately 180 degrees,

an internal body housed within said external body having an upper circular boss positioned to rest on the upper edge of said external body and a circular arch-shaped projection extending upward from said upper circular boss,

a vertical toothed portion on said external body positioned to contact said worm gear for rotation of said external body,

said external body and said internal body having a notch on one of said bodies and a matching tooth to fit in said notch on the other of said bodies;

a lid covering a portion of said box having a portion to receive said circular arch-shaped projection;

a hooking means on the bottom of said pinion for supporting a slat;

an internal vertical wall having at least a flexible upper portion with said upper portion adjacent a side of said lid;

means to move said pinion from its vertical position to a position at a slant from the vertical towards said internal vertical wall;

the movement of said pinion moving said lid against said flexible upper portion of said internal vertical wall with the return of said pinion to a vertical position returning said lid away from said internal vertical wall.

4,616,689

FOUNDRY MOULDING PROCESS AND MOULD USING A PATTERN OF GASIFIABLE MATERIAL SURROUNDED BY SAND FREE OF A BINDING AGENT FOR LOW PRESSURE PRECISION CASTING

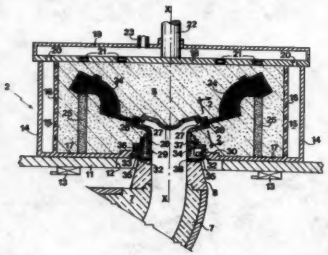
Jean-Pierre Denis, Nancy, France, assignor to Pont-A-Mousson S.A., Nancy, France

Filed Feb. 12, 1985, Ser. No. 700,839

Claims priority, application France, Feb. 15, 1984, 84 02907

Int. Cl.[4] B22C *9/04*; B22D *18/04*

U.S. Cl. 164—34 **17 Claims**



1. A foundry mould for the low pressure casting of metal parts comprising:

a mould chamber (**14**) including a bottom surface (**17**) with an opening (**31**) through which molten metal can ascend, and side walls (**16**);

a peripheral pressure chamber (**15**) surrounding said side walls, said side walls having apertures for communicating the interior of said mould chamber with said peripheral pressure chamber;

a sealing and suction means (**18, 19**) covering the top of said mould chamber and said peripheral pressure chamber, and containing suction apertures for communicating said sealing and suction means with said mould chamber and said peripheral pressure chamber;

at least one pattern (**24**) of gasifiable material positioned within said mould chamber;

masking means (**27, 42**) positioned in the vicinity of said opening (**31**) and being connected to said at least one pattern for supporting said at least one pattern in a position to receive said ascending molten metal;

binderless sand (**5**) surrounding said at least one pattern, and overlying said masking means, said masking means preventing sand from entering said opening; and

centering and locking sleeve means (**34**) located at least partially within said opening (**31**) for supporting said masking means, the lowermost portion of said sleeve defining the position of the mould casting mouth.

15. A method for low pressure foundry casting metal parts using a foundry mould chamber (**14**) having a bottom surface (**17**) with an opening (**31**) through which molten metal to be cast can ascend comprising the steps of:

positioning a pattern of gasifiable material in the mould chamber;

providing said pattern with an appendage;

mounting a masking device to said opening (**31**), and attaching said pattern appendage to a portion of the masking device to thereby support the pattern and locate the pattern a desired location relative to said opening;

filling the remaining volume of said mould chamber with binderless sand, the masking device preventing sand from entering said opening;

vibrating and pressure packing said sand to produce a rigid sand mass surrounding said pattern; and

applying ascending molten metal through said opening and said masking device to said pattern, the heat of the molten metal gasifying the pattern material allowing the molten material to replace the pattern material, thereby forming metal parts in the shape of the pattern as the molten metal cools.

4,616,690

PROCESS AND APPARATUS FOR MOULDING INGOTS OF FERRO-ALLOYS BY CHILL CASTING IN A COOLED COPPER MOULD

Michel Demange, LeFayet, and Louis Septier, Chamonix, both of France, assignors to Societe Francaise d'Electrometallurgie-SOFREM, Paris, France

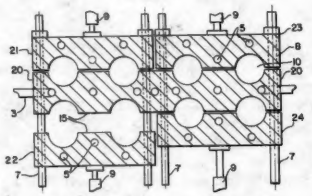
PCT No. PCT/FR84/00005, § 371 Date Sep. 6, 1984, § 102(e) Date Sep. 6, 1984, PCT Pub. No. WO84/02668, PCT Pub. Date Jul. 19, 1984

PCT Filed Jan. 6, 1984, Ser. No. 653,240

Claims priority, application France, Jan. 6, 1983, 83 00474

Int. Cl.[4] B22D *27/04*

U.S. Cl. 164—128 **10 Claims**



1. A process for molding ingots of ferro-alloys at a high casting rate, and extending the life of the mold material, comprising the steps of:

(a) forming an ingot mold by juxtaposing in sealed relationship two mold halves of copper of high thermal conductivity, having a thermal conductivity of at least 400 W/mK, at least one of said halves comprising a plurality of impressions of ingots to be molded, each said impression communicating with its adjacent impression in series by means of a duct, said series of impressions opening at the upper part of the ingot mold by means of at least one in-gate, and opening to the atmosphere after the final impression in series;

(b) establishing a cooling circuit in each mold half by circulation of a heat exchange fluid sufficient to maintain the high thermal conductivity copper of the ingot mold at all points at a temperature which substantially does not exceed 200° C.;

(c) pouring a liquid ferro-alloy into the in-gate until the ingot mold is filled, the mass of the copper forming said mold being at least about 6 times the mass of said liquid ferro-alloy;

(d) allowing said liquid ferro-alloy to solidify and cool to a temperature which is about 200° C. to about 300° C. below its solidus point; and

(e) immediately separating said mold halves to effect removal of the solidified, cooled ferro-alloy at the temperature of step (c) in the form of ingots.

4,616,691

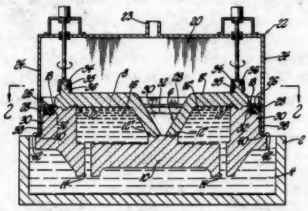
COUNTERGRAVITY CASTING APPARATUS

Karl D. Voss, Standish, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 9, 1985, Ser. No. 806,618

Int. Cl.[4] B22D *18/06*

U.S. Cl. 164—255 **3 Claims**



1. Apparatus for the vacuum countergravity casting of molten metal comprising:

a mold comprising a porous, gas-permeable upper shell at least in part defining a molding cavity and a bottom-gated lower portion secured to said upper shell for admitting said metal into said cavity from an underlying pot of said metal;

a sealing surface atop said mold and thermally remote from the metal in said pot;

a vacuum box defining a vacuum chamber confronting said upper shell for evacuating said cavity through said shell, said box comprising a peripheral wall having a lip on the underside thereof defining a mouth of said chamber;

an elastomeric gasket compressed between the underside of said lip and said sealing surface of said mold for sealing said mold to the mouth of said chamber; and

a skirt depending from said box beneath said lip so as to surround said gasket and shield it from heat radiating from said pot.

4,616,692

METHOD OF RECOVERING HEAT OF REACTION

Kenji Yasuda, Amagasaki, Tsutomu Nakamura, Osaka; Shinichi Tomita, Toyonaka, all of Japan, assignor to Hitachi Zosen Corporation, Osaka, Japan

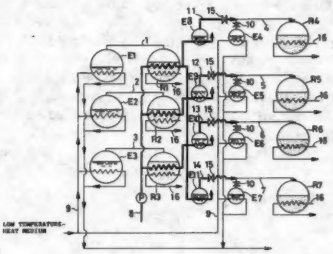
Filed Jun. 10, 1985, Ser. No. 743,135

Claims priority, application Japan, Jun. 12, 1984, 59-121112

Int. Cl.[4] F28D *21/00;* **F25B** *15/00*

U.S. Cl. 165—1 **2 Claims**

1. In a chemical heat storage or chemical heat pump system wherein 2 moles of water vapor is reacted with 1 mole of calcium bromide anhydride to utilize the heat of hydration evolved, a method of recovering the heat of reaction characterized by producing water vapor at a high temperature level by heating water in an evaporator with use of the heat of hydration evolved by the hydration reaction of calcium bromide monohydrate into calcium bromide dihydrate in a first reactor included in a plurality of reactors, and supplying the resulting water vapor to a second reactor included in the reactors as water vapor for the hydration reaction of the



monohydrate into the dihydrate, whereby heat is obtained substantially at the same high temperature level as the heat of hydration of the anydride into the monohydrate.

4,616,693

HEATING AND/OR AIR CONDITIONING APPARATUS FOR AUTOMOTIVE VEHICLES

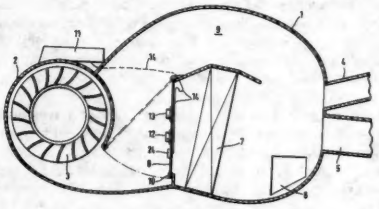
Kurt Dietzsch, Leonberg-Eltingen, and Karlheinz Witzel, Stuttgart, both of Fed. Rep. of Germany, assignors to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG, Stuttgart, Fed. Rep. of Germany

Filed Aug. 28, 1984, Ser. No. 645,091

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1983, 3331890

Int. Cl.[4] B60H *3/00*

U.S. Cl. 165—41 **23 Claims**



1. A heating and/or air-conditioning installation for automotive vehicles, comprising:

at least one blower;

at least one flap which affects the air flow through the installation;

an electronic control element which includes at least one heatgenerating electronic component mounted on said flap; and a thermally conductive connection for joining said flap to said component.

4,616,694

FIREPROOF CABINET SYSTEM FOR ELECTRONIC EQUIPMENT

Shih-yung Hsieh, Apt. 4G, 41-70 Union St., Flushing, N.Y. 11355

Filed Oct. 22, 1984, Ser. No. 663,344

Int. Cl.[4] A62C *37/18;* **F28D** *5/02;* **B67D** *1/08*

U.S. Cl. 165—47 **17 Claims**

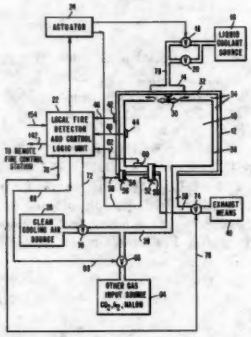
1. A system for protecting electronic equipment and maintaining its continuous function during an external fire in a room area surrounding said equipment, comprising:

a fire resistant and waterproof wall shield enclosure for

enclosing said equipment, said wall shield enclosure including an outer metal layer having a high thermal conductivity and providing a radiation shield, an adjacent support layer having a low thermal conductivity and high mechanical strength, and an inner wall duct means extending along the support layer on the inside of said wall shield means for passage of a gas coolant adjacent said wall shield enclosure for cooling said wall shield;

water supply means for continuously providing coolant water on substantially the entire outside surfaces of said outer metal layer of said wall shield enclosure to remove heat therefrom and preventing fire damage to said wall shield enclosure;

forced gas cooling means for providing coolant gas from outside said wall shield enclosure into said inner wall duct



means of said wall shield enclosure for cooling an interior thereof and also removing heat received from said outer metal layer, said forced gas cooling means including a coolant gas supply, an intake duct means leading from said coolant gas supply into the interior of said wall shield enclosure, and exhaust duct means for removing heated air from said inner wall duct means to the outside of said wall shield enclosure; and

control means responsive to the detection of a fire condition in said room area for activating said water supply means;

whereby said coolant gas in combination with said continuous coolant water on said outer metal layer act to decrease the heating effects of fire on said wall shield enclosure and remove heat from the interior thereof to maintain said electronic equipment in operation at a desired temperature and air quality.

4,616,695

HEAT EXCHANGER

Kenzo Takahashi, Kawanishi; Nobuo Kumazaki, Nakatsugawa; Hisao Yokoya, Tajimi; Hironobu Nakamura, and Tadakatsu Kachi, both of Nakatsugawa, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 7, 1985, Ser. No. 699,163

Claims priority, application Japan, May 11, 1984, 59-94101

Int. Cl.[4] F24H *3/02*

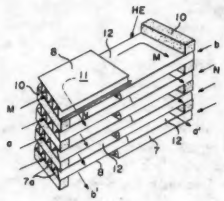
U.S. Cl. 165—54 **13 Claims**

1. A heat exchanger, comprising:

a plurality of partially overlapped plates disposed in mutual confrontation at predetermined spaced intervals to separate two fluids to be heat-exchanged;

a trapezoidally shaped fin disposed in said spaced interval among the mutually opposed plates to form a plurality of parallel flow paths for controlling flow of said two fluids in the space interval wherein the spaced intervals to be formed by said plates are in a plurality of stacked layers, and wherein an upstream portion where the fin is present and an empty space where no fin is present are so disposed in said plurality of spaced intervals in layer form that they are staggered in the direction of stacking the plates; and

a control member obliquely provided in each of said spaced intervals in layer form to separate and alternately lead into each space interval a primary fluid and a secondary fluid so that the heat exchanging operation may be effected between said primary fluid and said secondary fluid as led into each of said spaced intervals in layer form through



the partitioning plate in the course of their passage through said space interval in layer form, while producing a flow rate distribution in, and proper to, each of said fin section and said empty section by a static pressure loss distribution in the fin section wherein inlet ports for said two fluids to be heat-exchanged are provided on mutually opposite side surfaces and wherein outlet ports for said two fluids to be heat exchanged are provided on the same side surface.

4,616,696

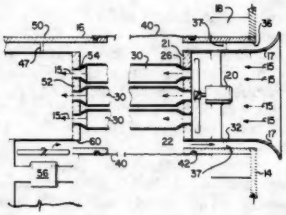
EXHAUST AIR HEAT EXCHANGER

Ewart Brundrett, and Laurence Brundrett, both of Baden, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Aug. 10, 1984, Ser. No. 639,408

Int. Cl.[4] F24H *3/02;* **F24F** *7/10*

U.S. Cl. 165—54 **3 Claims**



3. An apparatus for use in exchanging heat between incoming and outgoing air in a greenhouse said apparatus comprising a plurality of elongated nonconcentric inner tubes of thin walled flexible transparent plastic of a thickness capable of being inflated by air flowing through said tubes, an elongated housing of thin walled flexible transparent plastic of a thickness requiring that it be inflated by air flowing through said housing enclosing said inner tubes, means for supporting said inner tubes in a selected spaced apart relation within said housing, first manifold means in sealing engagement with said inner tubes and said housing, second manifold means in sealing engagement with said inner tubes and said housing and means on said first and second manifolds for forcing air through said inner tubes and said housing to cause air flow through and inflation of said tubes and said housing; the diameter of said inner tubes and said housing being great enough to prevent ice blocking said tubes, and provide a high flow rate and heat

exchange area to achieve heat exchanger effectiveness of at least 40% over a length of 10 meters.

4,616,697

HEAT EXCHANGER

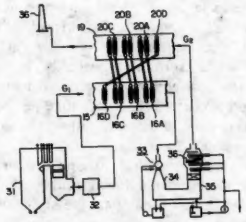
Ikuo Kotaka, Hiroshima, Japan, assignor to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 20, 1984, Ser. No. 622,725

Claims priority, application Japan, Jun. 21, 1983, 58-110233; Jun. 21, 1983, 58-110235; Jun. 22, 1983, 58-94949[U]

Int. Cl.[4] F28D *15/00*

U.S. Cl. 165—104.14 **1 Claim**



1. A heat exchanger incorporating a heat pipe apparatus, said heat pipe apparatus comprising:

a plurality of evaporative pipe groups disposed within a flow of a heating fluid;

a plurality of first condenser pipe groups located away from said evaporative pipe groups and disposed within a flow of fluid to be heated; and

first passage means for connecting said evaporative pipe groups with said condenser pipe groups and for circulating therethrough a working medium between said both pipe groups;

one evaporative pipe group of said evaporative pipe groups being disposed in an uppermost stream-side of the flow of heating fluid and connected by means of said first passage means to one condenser pipe group of said first condenser pipe groups disposed in an uppermost stream-side of the flow of the fluid to be heated, and the remainder of said evaporative pipe groups being so connected to the remainder of said first condenser pipe groups such that the evaporative pipe group disposed in an upper stream-side of the heating fluid is connected to the condenser pipe group disposed in a down stream-side of the flow of the fluid to be heated in order; and

said evaporative pipe group disposed in the uppermost stream-side of the flow of the heating fluid comprising tubular pipes provided therearound with fins, and said condenser pipe group disposed in the uppermost stream-side of the flow of the fluid to be heated comprising bare tubular pipes.

4,616,698

HEAT EXCHANGER FOR LIQUID/LIQUID HEAT EXCHANGER

Dick G. Klaren, Hillegom, Netherlands, assignor to Esmil BV, Amsterdam, Netherlands

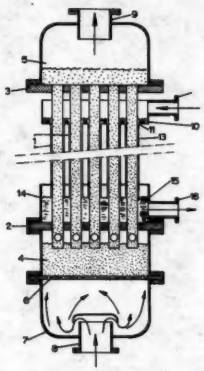
Filed Apr. 15, 1982, Ser. No. 368,569

Claims priority, application Netherlands, Apr. 24, 1981, 8102024

Int. Cl.[4] F28D *13/00, 3/02*

U.S. Cl. 165—104.16 **6 Claims**

1. Heat exchanger for liquid-liquid heat exchange having a plurality of parallel vertical tubes arranged for the upward transport within the tubes of a first heat-exchange liquid, supply and discharge tanks for the first liquid into which lower and upper ends of the said tubes respectively open, a granular mass which during operation is fluidized by the flow of the first liquid so as to occupy at least the said tubes, supply means for a second heat exchange liquid arranged to cause the second liquid to contact the tubes in the form of a film flowing downwardly along the outer surface of each tube, said supply means



for the second liquid having a slot extending around each of the said tubes, so that the second liquid forms the said film on passing through the slot and the discharge means for the second liquid arranged to collect the said films from the tubes.

4,616,699

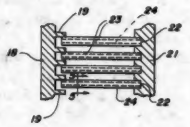
WICK-FIN HEAT PIPE

Michael G. Grote, Maryland Heights, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Jan. 5, 1984, Ser. No. 568,295

Int. Cl.[4] F28D *15/00*

U.S. Cl. 165—104.26 **7 Claims**



1. A heat pipe device comprising:

(a) a housing providing an elongated closed chamber havng closed ends;

(b) heat transfer fins in said closed chamber, each fin being characterized by having wicking grooves on opposite surfaces thereof, and said finss being arranged in longitudinally spaced groups with a group thereof being positioned adjacent each end of said closed chamber and providing extended heat transfer surfaces;

(c) heat transfer medium in said chamber capable of existing in liquid form upon giving up heat and existing in vapor form upon absorbing heat; and

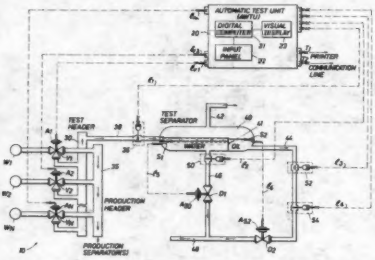
(d) wicking means in said chamber extending longitudinally in the closed chamber between said spaced groups of heat transfer fins for transferring the liquid form of said medium from one group of fins to another group thereof.

4,616,700

AUTOMATIC WELL TEST SYSTEM AND METHOD

John R. Wood; Margaret M. Siska, both of Houston, and Patrick A. Raymond, Sugarland, all of Tex., assignors to Hydril Company, Los Angeles, Calif.

Filed Sep. 18, 1984, Ser. No. 652,175
Int. Cl.[4] E21B *34/16, 43/12, 43/34*
U.S. Cl. 166—250 **8 Claims**



2. An automatic well test system for testing a plurality of wells in an oilfield comprising

a plurality of controllable diverter valves, one valve disposed in each output line of each well, each diverter valve having a divert line and a production line, each production line connected to a common production header,

a test header to which the divert line of each diverter valve is connected, the test header having a test output line,

a test separator having an input port to which the test header output line is connected, and having an emulsion oil output line and a free water output line, and having means for separating input fluid into a first section of emulsion oil and free water and a second section of emulsion oil, and having a first dump signalling means in said first section for generating a first dump signal indicative that free water in the separator is at a predetermined level, and having a second dump signalling means in said second section for generating a second dump signal indicative that emulsion oil in the second section is at a predetermined level,

a dump valve disposed in said free water output line responsive to said first dump signal for dumping free water in said first section of said test separator,

a dump valve disposed in said emulsion oil output line responsive to said second dump signal for dumping emulsion oil in said second section of said test separator,

a water/oil measuring means disposed in said emulsion oil output line for generating a signal indicative of the ratio of water to oil in said line,

a flow rate measuring means disposed in said emulsion oil output line for generating a signal indicative of the flow rate of the emulsion oil flowing in said line,

a flow rate measuring means disposed in said free water output line for generating a signal indicative of the flow rate of the free water flowing in the free water output line, and

a system controller means responsive to operator data inputs for automatically testing each well by,

sequentially signalling each of said controllable diverter valves associated with a well to direct the output of such well to its divert line and to said test separator, and in sequence for each well,

purging said test separator of free water and emulsion oil by counting the number of free water dumps and the number of emulsion oil dumps occurring after a well has been switched to the test separator and comparing the number of such dumps with respect to operator input data for such dumps for enabling the well test when the number of dumps specified by said operator input data has been accomplished, and

for each well in sequence, testing the well by generating a net oil flow rate signal in response to said signals indicative of said water to oil ratio flowing in said emulsion oil output line and to said signal indicative of the flow rate of the emulsion oil flowing in said emulsion oil output line signal and to said signal indicative of the flow rate of the free water flowing in the free water output line.

7. In an automatic well test system for testing a plurality of wells in an oilfield including a test separator and a test header connected to each of said wells and a test header output line connected between said test separator and said test header and a flow determining means in said header output line, a method for detecting leaks in any of the diverter valves prior to the testing of each well in sequence comprising the steps of

signalling all of said controllable diverter valves to connect each well to the production header,

maintaining the connection of each well to the production header for a predetermined wait time period,

monitoring said flow determining means in said test header output line, and

generating an alarm signal if a signal is generated by said flow determining means during said predetermined wait time, said alarm signifying that at least one of said diverter valves is leaking.

8. In an automatic well test system for testing a plurality of wells in an oilfield including a test separator and a test header connected to each of said wells and a test header output line connected between said test separator and said test header,

said test separator having means for separating within the separator emulsion oil from free water and having means for dumping free water via a free water output line after free water reaches a predetermined level in the separator and means for dumping emulsion oil via an emulsion oil output line after emulsion oil reaches a predetermined level in the separator,

a method for purging the test separator of emulsion oil and free water comprising the steps of

initiating purging of the test separator after a well has been switched to the test separator,

counting the number of free water dumps and the number of emulsion oil dumps occurring after the initiation of the purging of the test separator,

stopping the purging of the test separator when the number of free water dumps is greater than or equal to the operator input data for such water dumps and the number of emulsion oil dumps is greater than or equal to the operator input data for such emulsion oil dumps.

4,616,701

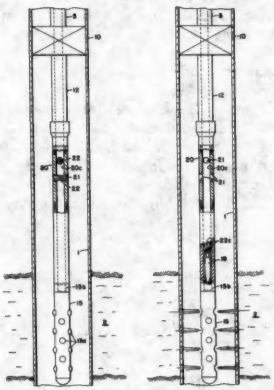
WELL PERFORATING APPARATUS INCLUDING AN UNDERBALANCING VALVE

Gregg W. Stout, Montgomery, and William D. Myers, Jr., Woodlands, both of Tex., assignors to Baker Oil Tools, Inc., Houston, Tex.

Filed Jun. 6, 1985, Ser. No. 742,095
Int. Cl.[4] E21B *43/116*
U.S. Cl. 166—55.1 **9 Claims**

1. Well perforating apparatus comprising: a tubing-carried perforating gun positionable adjacent a production formation, said gun having an impact detonatable primer at one end; a tubular conduit connectable between a tubing string and the top end of said perforating gun; at least one pair of axially aligned radial holes in the wall of said tubular conduit; and a frangible member traversing the bore of said tubular conduit, the ends of said frangible member being slidably and sealingly

mounted in said radial holes, whereby the dropping of a detonating bar through said conduit to detonate said primer breaks



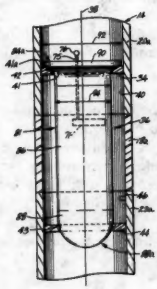
said member and opens said radial holes to pressured fluid flow from the perforated production formation.

4,616,702

TOOL AND COMBINED TOOL SUPPORT AND CASING SECTION FOR USE IN TRANSMITTING DATA UP A WELL

Merle E. Hanson, Livermore; Paul F. Titchener, Menlo Park, both of Calif., and Clifford W. Hamberlin, Kingwood, Tex., assignors to Comdisco Resources, Inc., San Francisco, Calif.

Filed May 1, 1984, Ser. No. 606,472
Int. Cl.[4] E21B *47/022, 47/06, 47/12*
U.S. Cl. 166—65.1 **78 Claims**



1. A tool for changing the electrical conductance across a nonconductive separation in a string of electrically conductive well casing in a well located in the earth, for transmission of data up the well, the casing having at least one inwardly extending landing shoulder for the tool, the tool comprising:

a housing elongated between first and second ends and comprising:

a first externally conductive housing portion, substantially circular in cross-section, for electrical connection to the casing on one side of the nonconductive separation,

a second conductive housing portion; substantially circular in cross-section, spaced from the first conductive housing portion for electrical connection to the casing on another side of the nonconductive separation from said one side, and

a nonconductive housing portion, substantially circular in cross-section, electrically separating

the first and second housing portions;

an outwardly extending landing shoulder on the housing for landing and for supporting the tool on the casing landing shoulder; and

controllable switch means contained in the housing for electrically connecting together and disconnecting the first and second housing portions to thereby cause changes in the electrical conductance in the casing across the nonconductive separation for flow of an electrical signal applied between earth and the casing.

56. A tool for changing the electrical conductivity across a nonconductive separation in a string of electrically conductive well casing in a well, for transmission of data up the well, the casing having at least one inwardly extending landing shoulder for the tool, the tool comprising:

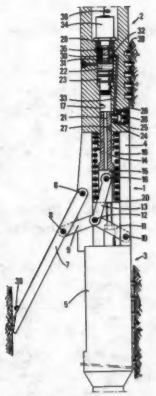
an elongated substantially bullet-shaped housing, a support shoulder extending radially out from the housing for landing and supporting the tool on the casing shoulder, first and second electrically conductive contacts electrically separated and spaced apart along the housing for separate electrical connection on opposite sides of the nonconductive separation to the electrically conductive casing string, the housing comprising an elongated nonconductive housing portion positioned between the first and second contacts, and switch means in the housing for electrically connecting together and disconnecting the first and second contacts.

4,616,703

DEVICE FOR ANCHORING A PROBE IN A WELL, BY OPENING MOBILE ARMS

Jean Laurent, Orgeval, and André Fabre, Saint-Cloud, both of France, assignors to Institut Francais du Petrole, France

Filed Jun. 29, 1984, Ser. No. 625,969
Claims priority, application France, Jul. 6, 1983, 83 11383
Int. Cl.[4] E21B *23/04*
U.S. Cl. 166—66.4 **6 Claims**



1. An anchorage device for immobilizing an apparatus lowered into a well by outwardly opening at least one anchorage arm which may pivot with respect to the apparatus, the anchorage device comprising a body, at least one spring, disposed in said body, a movable rod slidably positioned in said body and driven in translation by the expansion of the spring, means connecting said rod to the anchorage arm for transforming the translational movement of the rod into a pivoting movement of the anchorage arm and releasable means for immobilizing the rod in a compression position of the spring,

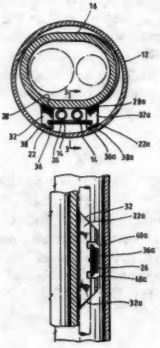
said releasable means comprising a bolt and means for pushing the bolt into engagement in a radial recess in the rod in the compression position of the spring, said anchorage device also comprising hydraulic means for moving the bolt out of engagement with the rod and releasing the rod, said hydraulic means including a cavity formed in the body of the apparatus, a head firmly secured to the bolt with a larger section than said bolt and adapted for sliding in said cavity, and a hydraulic circuit for intermittently applying a fluid to said bolt a pressure which is substantially constantly equal to the pressure prevailing in the well, thereby disengaging the bolt from the rod.

4,616,704

CONTROL LINE PROTECTOR FOR USE ON A WELL TUBULAR MEMBER

Russell A. Johnston, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed Jul. 26, 1985, Ser. No. 759,384
Int. Cl.[4] E21B *17/14*
U.S. Cl. 166—242 **10 Claims**



1. A control line protector for use on a well tubular member comprising,

first and second members having a first side for attachment to the outside of the tubular member in a parallel spaced relationship for enclosing a portion of a well control line,

each of said members having ends which are tapered inwardly for avoiding catching on any shoulders in a well,

each of said members having a longitudinal groove on the inside,

a plate adapted to be inserted in said grooves for enclosing a control line between the plate and the outside of the tubular member, and

means on each of the members for securing the plate in the grooves and to said members.

4,616,705

MINI-WELL TEMPERATURE PROFILING PROCESS

George L. Stegemeier; Peter Van Meurs, and Cor F. H. Van Egmond, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

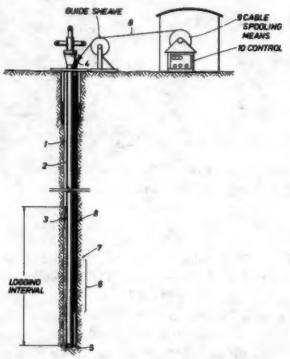
Continuation of Ser. No. 658,238, Oct. 5, 1984, abandoned. This application Mar. 24, 1986, Ser. No. 843,858
Int. Cl.[4] E21B *36/04, 47/06*
U.S. Cl. 166—250 **5 Claims**

1. In a process in which an elongated electrical resistance heater is installed and operated within a well for substantially uniformly heating an interval of subterranean earth formations which interval is longer than about 100 feet and is heated to a temperature between about 600° C. and a temperature damaging to the well or earth formation, an improvement for installing and operating the heater and measuring the pattern of temperature with depth along the heater, comprising:

positioning a spooled electrical heater and a spooled tubular stainless steel measuring conduit having an internal diameter of from about 5/16ths to 9/16ths inch at the well site and unspooling the heater and conduit substantially simultaneously into the well while periodically attaching the heater to the conduit so that the conduit supports the weight of the heater;

interconnecting a flexible weighting member, a thermocouple and a metal-sheathed cable for telemetering thermocouple responses, with those elements having outer diameters small enough to slide freely within the measuring conduit;

arranging the telemetering cable and a means for spooling and unspooling the metal-sheathed cable so that (a) the



gravitational force on the weighting means is capable of pulling the thermocouple and cable downward within the measuring conduit means while the cable is being unspooled and substantially straightening the bends imparted to the cable by the spooling means drum and (b) the correlation between the gravitational force on the weighing means and the diameter of the spooling means is such that the cold working of the cable is not more than about 0.3 percent;

arranging the metal-sheathed cable spooling means for unattended automatic operation capable of moving the thermocouple through the interval being heated at a rate of about 3 to 2000 inches per minute capable of maintaining a substantial thermal equilibrium between the thermocouple and the temperature within the well; and

operating the heater while measuring the pattern of temperature with depth throughout the interval.

4,616,706

APPARATUS FOR PERFORMING SUBSEA THROUGH-THE-FLOWLINE OPERATIONS

Roger W. Huffaker, and Paul N. Stanton, both of Houston, Tex., assignors to Exxon Production Research Co., Houston, Tex.

Filed Feb. 21, 1985, Ser. No. 703,961
Int. Cl.[4] E21B *23/08, 33/076*
U.S. Cl. 166—341 **6 Claims**

1. A subsea apparatus remotely operated from a surface support station for introducing and removing TFL tools through a receiving end of a subsea wellhead assembly comprising:

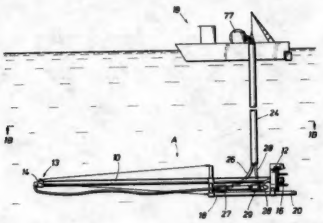
a subsea frame assembly remotely installable substantially adjacent said subsea wellhead assembly;

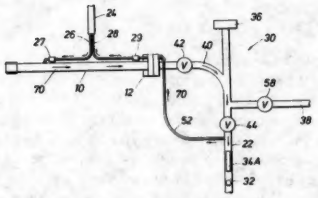
a first hollow elongate member connected to said subsea frame assembly and adapted to contain at least one TFL tool, said elongate member having a first sealed end and a

second end, said second end adapted to engage said receiving end of said wellhead assembly;

a second hollow elongate member connected to said subsea frame assembly and adapted to contain at least one TFL tool, said second elongate member having a first sealed end and a second end;

means for aligning said second end of said elongate members with said receiving end of said wellhead assembly, said aligning means being connected to said subsea frame assembly;





means for sealably engaging said second end of said elongate members to said receiving end of said wellhead assembly;

a diverter attached at one end to said second end of said first and second elongate members and attached at the other end to said means for sealable engagement, said diverter being adapted to alternate fluid communication between the interior of said first and second elongate members and the interior of said wellhead assembly; and

means for circulating fluid within said elongate member and said wellhead assembly to transport the TFL tool between said elongate members and said wellhead assembly.

4,616,707

RISER BRAKING CLAMP APPARATUS

Carl G. Langner, Spring, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 8, 1985, Ser. No. 720,841

The portion of the term of this patent subsequent to Oct. 8, 2002, has been disclaimed.

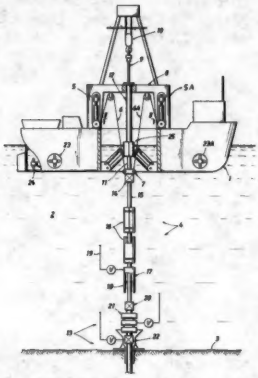
Int. Cl.[4] E21B *19/09*

U.S. Cl. 166—345 **9 Claims**

1. For use in a floating vessel having a substantially centrally positioned vertical hull opening therethrough, said vessel being provided with well drilling equipment, including an elongated vertical riser, said riser extending in tension down through said hull opening to a point adjacent the ocean floor, and motion-compensating and tensioning means carried by said vessel operatively connected to said riser for tensioning said riser during normal operations, the invention comprising:

riser braking clamp apparatus located substantially within the hull opening through the vessel, said riser braking clamp apparatus comprising:

telescopic joint means having a first member and a second member, each member having a lower end and an upper end and an axial throughbore, said lower end of said first member operatively connected to said upper end of said riser, said upper end of said first member slideably engaged with said lower end of said second member, said second member operatively connected to said vessel; and



brake means carried by one member of said telescopic joint means, operatively and selectively engageable with said other member of said telescopic joint means, to dampen, arrest, and prevent further movement of said first member relative to said second member of said telescopic joint means.

4,616,708

RISER TENSIONING SYSTEM

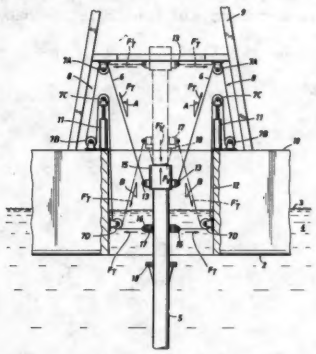
Augusto L. C. da Mota, The Hague, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 21, 1985, Ser. No. 800,185

Claims priority, application United Kingdom, Jan. 25, 1985, 8501920

Int. Cl.[4] E21B *19/09*

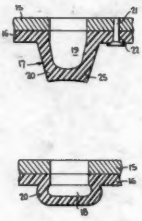
U.S. Cl. 166—355 **10 Claims**



1. Riser tensioning system for a riser extending between a platform floating in a body of water and a submerged riser base, the system comprising at least one riser tensioner cable running along a set of sheaves that form part of a heave compensator unit mounted on the platform, the riser tensioner cable being operatively connected to the riser and to a collar which is slidably arranged around the riser, wherein stop means are provided to restrict axial movement of the collar relative to the riser if the riser after disconnection thereof from

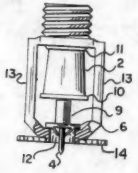
the base is pulled in upward direction by means of the tensioner cable.

4,616,709
PODDED CLEAT HORSESHOE
James M. Lee, 351 Warwick Ave., South Orange, N.J. 07079
Filed Feb. 22, 1985, Ser. No. 704,183
Int. Cl.[4] A01L *5/00, 7/06*
U.S. Cl. 168—13 **15 Claims**



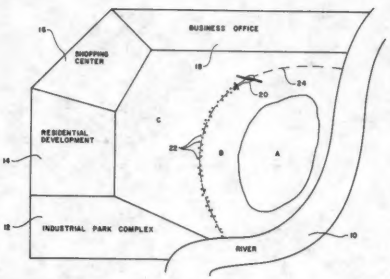
1. A horseshoe comprising:
a base member for attachment to a horse's hoof as a lower part thereof and having a bottom surface; and
a plurality of podded cleats extending generally downwardly from the bottom surface of said base member in spaced relationship along at least the area of said bottom surface adjacent the peripheral region thereof to support the horn of the hoof around the peripheral region thereof;
each podded cleat comprising
a pod of elastomeric material protruding from the bottom surface of said base member, and a hollow cavity within said pod having a size and shape relative to the dimensions of the pod to form a wall surrounding said cavity which facilitates substantial compression of the pod under impact and compressive load by mechanical collapse of said wall to maximize cushioning of the impact and load on the horse's hoof in use.

4,616,710
HEAT-RELEASED PLUG
Frank J. Pilant, P.O. Box 634, Pine Valley, Calif. 92062, and Milton D. Cornsweet, 3608 Lorimer La., Encinitas, Calif. 92024
Filed Dec. 27, 1984, Ser. No. 686,689
Int. Cl.[4] A62C *37/18*
U.S. Cl. 169—41 **12 Claims**



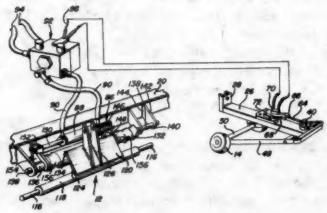
1. A heat-released plug assembly for obstructing the flow of fluid from an opening which comprises:
a resilient, generally cylindrical body having an axial bore therethrough;
a rod engaged through said bore;
a barrier at one end of said rod for stopping the axial translation of said body along said rod;
a fusible spacer mounted between said body and the other end of said rod; and
means engaged over the other end of the rod and against said spacer for compressing the body axially against said barrier, including a self-gripping means for limiting the recoiling movement of said body.

4,616,711
SYSTEM AND METHOD OF CONTROLLING AND PREVENTING THE SPREAD OF FOREST FIRES
John D. Johnson, 1009 Julian Pl., Rockville, Md. 20852
Filed Aug. 27, 1984, Ser. No. 644,621
Int. Cl.[4] A62C *1/00*
U.S. Cl. 169—45 **1 Claim**



1. A method of controlling a land fire such as a forest fire comprising the steps of: forming a foam strip along a land area spaced from an area where fire is present; the step of forming said foam strip including flying an aircraft over the selected area where the foam strip is to be formed, dropping containers containing the foam along the selected area, and actuating said foam containing containers to release the foam upon or after impact of the containers with the ground such that a continuous foam strip is formed along an area spaced from the area where fire is present; and back burning from the foam strip towards the area of fire so as to burn material disposed between the formed foam strip and the area of fire in order to control the movement of fire and to generally prevent the fire from spreading over and beyond the foam strip.

4,616,712
ROW FINDER
Ray G. Jorgensen, R.R. 3, Box 44, Hampton, Iowa 50441
Filed Oct. 10, 1984, Ser. No. 659,536
Int. Cl.[4] A01B *69/00*
U.S. Cl. 172—6 **10 Claims**



7. A row finder system for positioning an implement in predeterminded orientation in relation to a desired path of movement of the implement along a ground surface comprising a sensing device supported for engagement with guide means associated with the ground surface and defining the desired path of movement of the implement and an adjusting device supported for moving the implement sideways in relation to the actual path of movement in response to control from

the sensing device to maintain an implement in predetermined orientation in relation to the guide means defining the desired path of movement, said guide means adapted to cooperate with a ridge in a ridge planting system, said sensing device including wheel means adapted to cooperate with a guided by said ridge with deviation of the wheel means from a desired path of movement controlling the adjusting device to move the implement sideways to center it in relation to the ridge and the desired path of movement, said adjusting device comprising a generally horizontally disposed piston and cylinder assembly oriented transversely of the path of movement and interposed between a vehicle and implement connected thereto for moving the implement sideways in relation to the vehicle in response to control from the sensing device, said implement being supported from a transversely extending tool bar, said sensing device also being supported from said tool bar, said adjusting device being interposed between the tool bar and a three point hitch mounting assembly, said adjusting device including a double acting hydraulically operated piston and cylinder assembly, means connecting one end of the piston and cylinder assembly to the tool bar and means connecting the other end of the piston and cylinder assembly to the three point hitch mounting assembly for moving the tool bar sideways in relation to the hitch assembly, said means connecting the piston and cylinder assembly to the tool bar including brackets on the tool bar engaged with a horizontal support member, a sleeve slidable on the horizontal support member and laterally fixedly engaged with the three point hitch mounting assembly, one end of the piston and cylinder arrangement being connected to the sleeve and the other end being connected to the horizontal member to cause lateral movement of the tool bar upon actuation of the piston and cylinder assembly, said wheel means including a pair of inclined wheels, a mounting assembly for supporting said wheels and enabling said wheels to follow the inclined side surfaces of a pair of ridges, switch means mounted for actuation by said wheel mounting assembly when the wheels move laterally in relation to the implement, said piston and cylinder assembly being communicated with the hydraulic system of the farm tractor through a solenoid controlled valve, said switch means being connected to the valve and electrical system of the tractor for controlling the valve and position of the tool bar and implement in response to actuation of the switch means, said switch means including two adjustably supported switches to sense deviation in two directions.

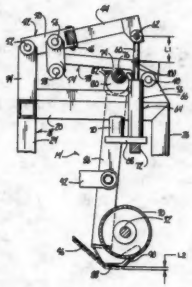
4,616,713

BLADE ADJUSTMENT DEVICE FOR SOD CUTTING MACHINE

Thomas G. Shattuck, P.O. Box 818, R.R. 2, Waukee, Iowa 50263

Filed Nov. 29, 1984, Ser. No. 676,491
Int. Cl.[4] A01B *45/04*; G05G *1/04*
U.S. Cl. 172—19 **5 Claims**

1. A sod cutting machine comprising:
a machine frame;
a sod roller rotatably mounted to said machine frame for rotation about a horizontal sod roller axis;
a blade supporting frame having a sod cutting blade attached thereto;
a linkage mechanism pivotally interconnecting said machine frame and said blade supporting frame for permitting selective movement of said blade toward and away from said sod roller between first and second blade positions relative to said sod roller, said blade being closer to said roller when in said second blade position than when in said first blade position;
said linkage mechanism comprising first, second and third links, each of which have first and second ends,
said first ends of said first and second links being pivotally connected to said machine frame about first and second horizontal link axes, respectively;
said first link being pivotally connected to said first and second links about third and fourth link axes, respectively;
said blade supporting frame being pivotally connected to said second link about a fifth link axis;
a power means pivotally connected to said first link at an



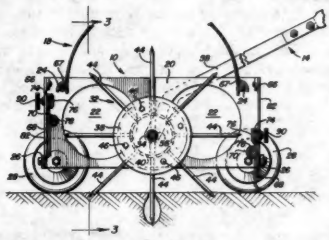
input point for moving said first link between first and second input positions; said second and third links, said blade supporting frame, and said blade being movable in response to movement of said first link between said first and second input positions for causing said blade to move between said first and second blade positions.

4,616,714

SOIL PERFORATOR

Robert W. Lister, 570 Den-Mar Ct., Greensburg, Pa. 15601

Filed Dec. 17, 1984, Ser. No. 682,742
Int. Cl.[4] A01B *45/02*
U.S. Cl. 172—21 **12 Claims**



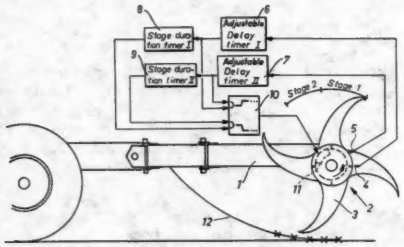
1. A soil perforator comprising a wheeled frame, a spiked rotor for mounting on the frame in a manner enabling the rotor spikes to penetrate soil accompanied by rotation of the rotor when the frame is moved along the ground, and a handle for manually pushing the assembled frame and rotor along the ground, wherein the frame includes side plates with top-opening vertical slots defining means for vertically adjustably mounting the rotor in the frame, wherein the rotor includes a rotor shaft with end portions adapted to project outwardly through the slots, and means for releasably clamping the shaft in selected vertical position in the slots, wherein the handle has arms received on the end portions of the shaft, wherein the rotor comprises plural spiked disc assemblies freely rotatably mounted on the shaft and spacer means, separate from the disc assemblies, the spacer means being mounted on the shaft between the respective disc assemblies, the disc assemblies and spacer means being removable from the shaft upon removal of the rotor from said slots for enabling the number of assemblies on the shaft to be changed so as to vary the density of soil perforations formed by the perforator.

4,616,715
FOREST MATTOCK WITH BRAKED ROTATION SYSTEM

Aarre Sinkkilä, 16630 Tenniläi, Finland

Filed Dec. 13, 1983, Ser. No. 560,800
Claims priority, application Finland, Dec. 15, 1982, 824301
Int. Cl.[4] A01B *39/08*
U.S. Cl. 172—61 **5 Claims**

1. A turf-building forest mattock, for use in timed digging, grading the surface, and accumulating earth upon the ground during its operations, comprising a mattock means in the form of a gear with multiple picks, the rotation of said mattock means being adapted to be braked stepwise in a timed manner that each pick of the gear in turn works the ground in a first digging stage, brake means operatively associated with the mattock means to stop its turning while one of said picks digs into the ground to form a hole during said first digging stage, sensor means responsive to a first pick position, a timer means responsive to the sensor means and timing the length of time



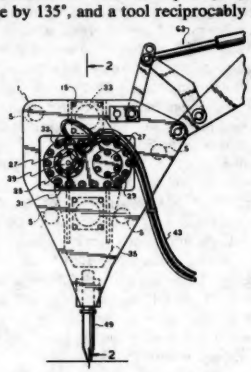
during which one of said picks of the mattock means digs within the ground, the timer means after a short segment of time signaling a release of the brake means for the turning of the mattock means for a short distance and in a manner that provides an intermediate work stage of the mattock means wherein one of said pick of said mattock means removes surface deposits from the ground in front of the finished hole, and said one of said picks of the mattock means after a defined removal of surface deposits releases the turf to be built into a mound of earth upon the ground.

4,616,716
SYNCHRONOUS VIBRATORY IMPACT HAMMER

Edward J. Bouplon, Solon, Ohio, assignor to Allied Steel & Tractor Products, Inc., Solon, Ohio

Continuation-in-part of Ser. No. 353,628, Mar. 1, 1982, abandoned. This application Mar. 26, 1984, Ser. No. 593,678
Int. Cl.[4] B25D *11/06*
U.S. Cl. 173—49 **8 Claims**

1. A vibratory impact hammer including a support frame, a hammer body assemblage suspended within the support frame by resilient means, having a selected suspension system spring rate, arranged to provide guiding and damping action in either direction of axial movement of the hammer body assemblage, said hammer body having a given stroke, wherein the stroke of the hammer body assemblage is equal to 2 wr/W, wherein w=unbalanced weight, r=radius where unbalance is located from the center of rotation and W=total weight vibrated, said resilient means being the sole means engaging the hammer body assemblage so that extraneous frictional forces are avoided, vibration drive means, including a pair of oppositely rotating eccentric weights, arranged to develop a forcing frequency to vibrate the hammer body assemblage in an axial direction, said forcing frequency, responsive to the relationship between hammer weight, eccentric weight, and spring rate of the suspension system so selected that the eccentric weights lead (set to lead the vibrated frequency of) the hammer body assemblage by 135°, and a tool reciprocably mounted in

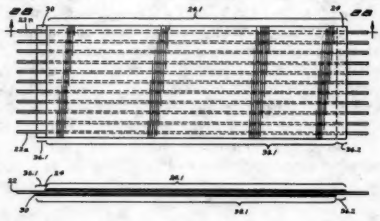


the support frame and positioned to receive impact blows of the hammer body assemblage when reciprocated by the vibration drive means.

4,616,717
FLEXIBLE WIRE CABLE AND PROCESS OF MAKING SAME

Edwin J. Luetzow, Northfield, Minn., assignor to Tel Tec Inc., Farmington, Minn.

Filed Nov. 9, 1978, Ser. No. 959,074
Int. Cl.[4] H01B *7/08*
U.S. Cl. 174—117 F **28 Claims**



1. A flexible wire cable comprising a plurality of wire conductors and two insulation sheets adhesively bonded over and around said wire conductors to substantially surround each of said wire conductors by one hundred and eighty degrees and form channels in between each of said wire conductors, and offsetting and overlapping at least one end of said insulation sheet beyond the other end of said insulation sheet whereby said wire conductors extend beyond said ends of said overlapped insulation sheets.

4,616,718
FIRING HEAD FOR A TUBING CONVEYED PERFORATING GUN

Louis M. Gambertoglio, The Woodlands, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Aug. 5, 1985, Ser. No. 762,171
Int. Cl.[4] E21B *43/17*
U.S. Cl. 175—4.54 **12 Claims**

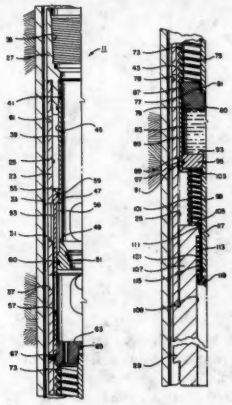
1. A firing head for a tubing conveyed perforating gun of the type which uses a firing pin to strike an explosive charge to perforate a well bore for production of well bore fluids, comprising:

a tubular sub having an interior bore and oppositely disposed connecting ends for connection in a well pipe string;

a firing pin contained within said interior bore and initially restrained in a cocked position by a firing pin holder;

biasing means for propelling said firing pin toward said explosive charge upon the release of said firing pin holder; and

hydraulic delay means contained within said interior bore and actuable by a pressure change within said sub interior bore from the well surface to move said firing pin holder out of locking engagement with said firing pin to release said firing pin after a predetermined time interval, and wherein said hydraulic delay means includes a fluid piston



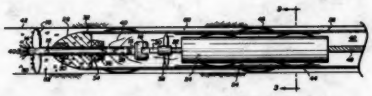
located within a fluid chamber and a means for evacuating said chamber.

4,616,719

CASING LATERAL WELLS

Newton B. Dismukes, 2952 Buttonwood Dr., Carrollton, Tex. 75006

Filed Sep. 26, 1983, Ser. No. 535,990
Int. Cl.[4] E21B *4/04*
U.S. Cl. 175—94 **16 Claims**



1. A system for overcoming a resistance to advance of a pipe string in a well bore at least partly filled with drilling fluid comprising:

a. A rotary prime mover releasably mounted inside the nether end of said pipe string;

b. A marine screw propeller means spaced outside of, and beyond, said pipe string; and

c. Means interconnecting said prime mover and said propeller whereby said propeller may be rotated by said prime mover to provide an advancing force acting on said pipe string.

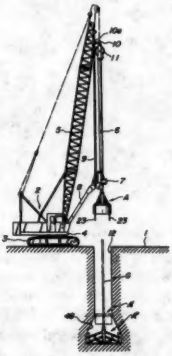
4,616,720

DIVIDED-BUCKET TYPE ROTARY EXCAVATOR

Katsumi Kitanaka, 24-8, Sakuragaoka-Cho, Shibuya-Ku, Tokyo, Japan

Filed Sep. 24, 1984, Ser. No. 653,841
Claims priority, application Japan, May 15, 1984, 59-95751
Int. Cl.[4] E21B *11/00, 7/28*
U.S. Cl. 175—267 **8 Claims**

1. A divided bucket type rotary excavator comprising a plurality of cutter units having generally flat bottom plates and curved sidewalls with bits on their leading edges, said cutter units being arranged about a center shaft and mounted to be radially movably toward and away from said center shaft, said center shaft consisting of an outer hollow cylinder having a polygonal cross-section and an inner hollow cylinder slidably fitted in said outer hollow cylinder, and the excavator further comprising a fluid operated cylinder arranged in said inner and outer hollow cylinders to move said center shaft telescopically, a set of parallel links connecting said outer hollow cylinder to each said cutter unit, and a link having a length one half of that of said parallel links for connecting a middle point of each



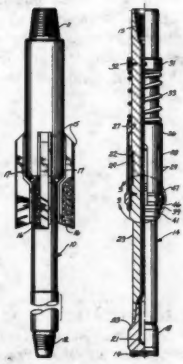
lower link of said parallel links to a lower end of said inner hollow cylinder, thereby moving said cutter units radially toward and away from said center shaft by telescopically moving said outer and inner hollow cylinders relatively to each other by means of said fluid operated cylinder.

4,616,721

PACKER MILL

John H. Furse, Kingwood, Tex., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Nov. 27, 1984, Ser. No. 675,354
Int. Cl.[4] E21B *17/06*
U.S. Cl. 175—320 **20 Claims**



1. A packer mill comprising:

catcher means for passing through the bore of a packer and catching remains of a milled packer; and

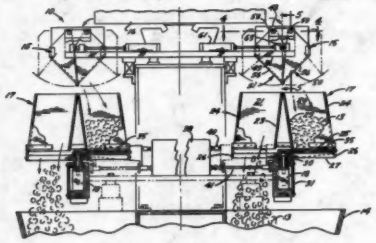
release means for releasing the remains of a packer upon application of a selected lifting force by failing in tension at a single location and formed to remain in a single piece and be retained on the packer mill after failing in tension.

4,616,722

WEIGHING APPARATUS WITH COMPARTMENTALIZED WEIGHING BUCKET

Michael J. Moran, Raleigh, N.C., assignor to USM Corporation, Farmington, Conn.

Filed Mar. 28, 1985, Ser. No. 717,002
Int. Cl.[4] G01G *13/22, 19/22, 13/16*
U.S. Cl. 177—99 11 Claims



1. Weighing apparatus comprising a weighing bucket unit having first and second side-by-side and generally upright containers for momentarily holding product to be weighed, means associated with said weighing bucket unit for producing a signal representative of the weight of the product in said containers, means for receiving the product from the containers after the product has been weighed, each of said containers having open upper and lower ends, metering means positioned above said containers for intermittently dropping alternate batches of product into the upper ends of alternate containers whereby the containers are filled alternately, a door mounted to shuttle back and forth beneath the lower ends of said containers along a substantially linear path, means for moving said door along said path between (1) a first position in which the door opens the lower end of said first container and closes the lower end of said second container and (2) a second position in which the door closes the lower end of said first container and opens the lower end of said second container, said last-mentioned means moving said door from said first position toward said second position at substantially the same time said metering means start dropping product to said first container and moving said door from said second position toward said first position at substantially the same time said metering means start dropping product to said second container whereby product may be dropped to one container while product is dropping out of the other container.

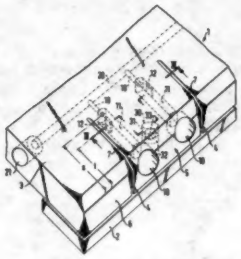
4,616,723

WHEEL LOAD INDICATOR

Ludwig Pietzsch, Karlsruhe; Knud Overlach, Ettlingen, and Siegfried Gassner, Pfinztal, all of Fed. Rep. of Germany, assignors to Ing Ludwig Pietzsch GmbH & Co., Ettlingen, Fed. Rep. of Germany

Filed Jun. 19, 1985, Ser. No. 746,294
Claims priority, application European Pat. Off., May 15, 1985, 85106025.1
Int. Cl.[4] G01G *3/14, 19/02, 19/52*
U.S. Cl. 177—211 25 Claims

19. In a flat plate wheel load indicator adapted for support at its lateral edges and having plate with its lateral edges slotted to form a plurality of laterally extending webs to which strain gauges are attached, the improvement wherein said strain



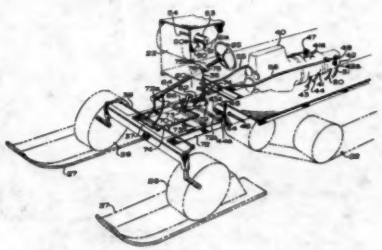
gauges are located internally of cavities extending into said webs from said lateral edges.

4,616,724

STEERING MECHANISM FOR ALL SEASON VEHICLE

Gary Lemke, Marcell, Minn., assignor to ASV Corporation, Marcell, Minn.

Filed Mar. 25, 1985, Ser. No. 715,205
Int. Cl.[4] B62D *11/04*
U.S. Cl. 180—6.48 20 Claims



1. A control mechanism for steering an all-seasons vehicle comprising:

(a) a pair of tread means having motors producing movement of each said tread means over the terrain traversed by the vehicle;

(b) power means operably connected to said motors of said pair of tread means for causing movement of the same, said power means having a pair of controlable valve means controlling the flow of power to said motors;

(c) tread control means having a movable handle pivotally connected at the bottom thereof and including an arm extended outwardly and above the bottom of said movable handle, said tread control means connected to said pair of controllable valve means;

(d) oscillating block means having an axis of fluctuation at right angles to said movable handle pivot, said oscillating block means having slot means as a part thereof facing said movable handle through which said extended arm is disposed causing relative actuation of said valve means; and

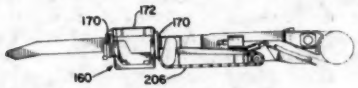
(e) steerable means engaging the terrain over which the vehicle moves, and communicating with said oscillating block means providing steering control for the vehicle.

4,616,725

SUSPENSION SYSTEM FOR OPERATOR'S COMPARTMENT

Donald E. McDaniel, Clintonville, Pa., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Feb. 1, 1984, Ser. No. 575,952
Int. Cl.[4] B62D *33/06*
U.S. Cl. 180—89.13 15 Claims



1. A suspension system for the operator's compartment of a mine vehicle having a body wherein the operator's compartment is of the type freely floatingly supported on said body adjacent one side thereof for riding on the mine floor as said vehicle moves in said mine, said suspension system comprising:

a chain means secured to said body for supporting said compartment for generally vertical movement with respect to said body; and

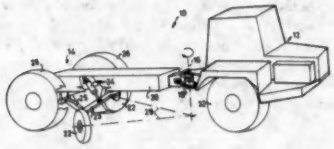
said chain means includes means for distributing equally to each end of said compartment the forces developed between said mine floor and any point on the operator's compartment whereby each end of said operator's compartment moves the same upward vertical distance with respect to said body as said operator's compartment floats upwardly in response to enegagement with said mine floor.

4,616,726

DEVICE FOR TURNING AN ARTICULATED MOTOR VEHICLE

Sixten Johansson, Eskilstuna, Sweden, assignor to VOLVO BM AB, Eskilstuna, Sweden

Filed Oct. 31, 1985, Ser. No. 793,296
Claims priority, application Sweden, Nov. 8, 1984, 8405593
Int. Cl.[4] B62D *13/06, 53/00*
U.S. Cl. 180—135 4 Claims



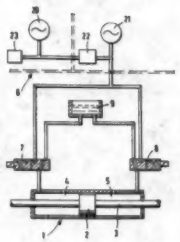
1. Articulated motor vehicle, especially a dumper, comprising a front drive unit supporting vehicle portion and a rear load carrying vehicle portion, said vehicle portions being articulated about a vertical axis and swingable in relation to each other about said axis by power means, characterized in that the rear vehicle portion is mounted on at least one supporting wheel, which can be lowered to the road surface to raise the rear vehicle portion and which, in the lowered position, has its axis of rotation lying in a vertical plane substantially intersecting the vertical axis of articulation between the vehicle portions.

4,616,727

HYDRAULIC STEERING FORCE BOOSTER

Dieter Kircher, Frankfurt am Main; Hubertus von Gruenberg, Kronberg; Klaus D. Blum, Kelkheim, and Peter Becker, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 14, 1985, Ser. No. 711,856
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1984, 3410033
Int. Cl.[4] B62D *5/08, 5/10*
U.S. Cl. 180—142 4 Claims



1. A device for boosting the steering force on a steering arm of a steering system comprising:

a hydraulic cylinder;

a piston in said cylinder dividing said cylinder into two working chambers and including a piston rod adapted to be connected to the steering arm of said steering system;

a pair of electrically operated multidirection, hydraulic, control valves each having an outlet connected to a respective one of said two working chambers and an inlet;

two hydraulic pressure accumulators each accumulator connected to an external hydraulic fluid pressure source and having outlets connected together and to said control valves in parallel relationship;

a normally closed pressure responsive priority switch at the outlet of one of said accumulators isolating said one accumulator from the outlet of the other accumulator, said priority switch responsive to open at a predetermined outlet pressure from said second accumulator; and

electrical control means for operating said control valves to direct fluid to said working chambers in response to movement of a steering wheel including at least a pair of electrical switches responsive to the position of said steering wheels, each switch electrically coupled to a respective one of said control valves for sending an operating signal to said control valves.

4. The device of claim 1, wherein said electrical control means further includes means for comparing an actual vehicle speed to a predetermined threshold value and generating an electrical signal for controlling the operating signal from said switches;

electrical means for generating a signal when a first gear, a second gear, and a reverse gear is engaged; and

a gate having inputs coupled to said means for comparing the vehicle speed and the threshold value and to the signal from said means for generating a signal responsive to the first, second, and reverse gear, said gate having an output coupled to said switch, whereby said signal from said gear responsive electrical means controls said control valves only below the threshold speed value.

4,616,728

POWER STEERING DEVICE

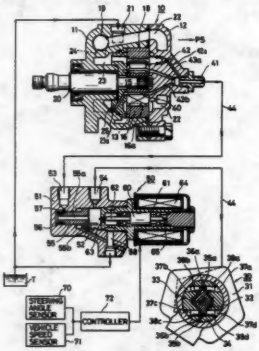
Yoshio Suzuki, and Takeshi Ohe, both of Saitama, Japan, assignors to Jidoshi Kiki Co., Ltd., Tokyo, Japan

Filed Mar. 13, 1985, Ser. No. 711,439

Claims priority, application Japan, Mar. 13, 1984, 59-46584

Int. Cl.[4] B62D *5/06*

U.S. Cl. 180—142 **13 Claims**



1. In a power steering device including a vane type oil pump having vanes which are radially movable in slits of a rotor to supply a first portion of hydraulic fluid from an oil tank to a power cylinder through a flow passage switching valve, the improvement wherein secondary pumping chambers are defined behind said vanes at base ends of said slits, and a second portion of hydraulic fluid having a pressure built up by reciprocal motion of said vanes in said chambers is supplied to an input of a solenoid coil type flow control valve and through an output thereof to hydraulic reaction force chambers which impart a reaction force to a steering wheel which operates said flow passage switching valve, said flow control valve having a pressure-operated first valve means for decreasing a fluid pressure level at said flow control valve output independently of a fluid pressure level at said input, and a second valve means operated by a solenoid coil for changing said fluid pressure level at said flow control valve output.

4,616,729

TRANSMISSION CHAIN ADJUSTER FOR MOTORCYCLES

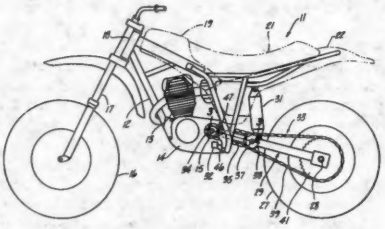
Yasuhiro Kasai, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Mar. 6, 1985, Ser. No. 708,708

Claims priority, application Japan, Mar. 7, 1984, 59-44395

Int. Cl.[4] B62K *25/02*

U.S. Cl. 180—231 **14 Claims**



1. A chain drive for a wheeled vehicle comprising frame means, power means carried by said frame means for driving a drive shaft rotatably about a first axis extending transversely to the longitudinal axis of said frame means, trailing arm means supported for pivotal movement about a pivot axis by said frame means, an idler shaft rotatably journaled on said trailing arm means about a second axis parallel to said first axis and said pivot axis and spaced therefrom, first flexible transmitter means driving said idler shaft from said drive shaft, a wheel journaled by said trailing arm means for rotation about a third axis spaced from said first, said second and said pivot axes, second flexible transmitter means for driving said wheel from said idler shaft and means for adjusting the distance between said second axis and said first axis for adjusting the tension of said first flexible transmitter means.

4,616,730

CONTROL CHAIN CONNECTION

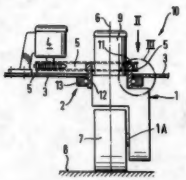
Richard Strehler, Chieming, and Guenter Babisch, Munich, both of Fed. Rep. of Germany, assignors to Carl Hurth Maschinen und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany

Filed May 9, 1985, Ser. No. 732,484

Claims priority, application Fed. Rep. of Germany, May 30, 1984, 3420146

Int. Cl.[4] B62D *1/20*

U.S. Cl. 180—253 **6 Claims**



1. In a control chain connection between a sprocket on a drive motor and a drive unit of an industrial vehicle having a steerable drive wheel, said steerable drive wheel having an inner ring to which is secured said drive wheel and a support means for supporting said inner ring for movement about a vertically upright axis, said control chain at least partially encircling said inner ring so as to define two mutually adjacent ends, the improvement comprising wherein said inner ring has a plurality of holes therein arranged on a circle which concentrically surrounds said pivot axis, wherein a chain holder is provided and includes a pin adapted to be received in a selected one of said holes, said chain holder having securement means thereon for releasably securing said two mutually adjacent ends of said control chain together, said securement means including a chain tensioning means thereon for facilitating a tensioning of said control chain.

4,616,731

SPEAKER SYSTEM

James R. Robinson, 6001 W. Indianapola, Phoenix, Ariz. 85033

Filed Mar. 2, 1984, Ser. No. 585,828

Int. Cl.[4] H05K *5/00*

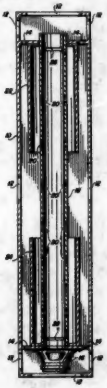
U.S. Cl. 181—148 **17 Claims**

1. An improved speaker assembly, comprising:

a speaker having a frontal side;

a tube having one open inlet portion and at least one open outlet portion;

first means proximate said speaker for permitting the passage of air into said tube; and



second means coupled to said speaker and to said tube for positioning said inlet portion adjacent the frontal side of said speaker so as to receive sound waves therefrom.

4,616,732

SILENCING SYSTEM FOR EXHAUST GASES FROM INTERNAL COMBUSTION ENGINES

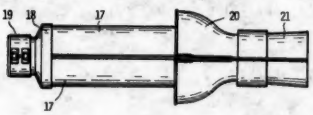
Luigi Carboni, Turin, Italy, assignor to S.I.V. S.p.A., Volvera, Italy, a part interest

Filed Sep. 10, 1985, Ser. No. 774,535

Claims priority, application Italy, Sep. 18, 1984, 67930 A/84

Int. Cl.[4] F01N *1/10, 1/14, 7/02*

U.S. Cl. 181—232 **14 Claims**



1. A silencing system for exhaust gases from internal combustion engines, comprising an intermediate silencing device having an inlet for connection to the exhaust manifold of an engine and an outlet, a final silencing device having an inlet for connection to the outlet of said intermediate silencing device and an exhaust outlet, wherein said final silencing device comprises an envelope, a number of spaced annular members arranged in said envelope forming a plurality of successive non-identical groups, and a number of perforated radial partition walls intersecting said annular members, whereby said annular members and partition walls define successive series of chambers having different characteristics which occupy the peripheral portion of said envelope and open towards the axial portion of said envelope by leaving said axial portion substantially free for passage of the flow of exhaust gases.

4,616,733

METHOD AND APPARATUS FOR REDUCING GEAR BACKLASH IMPACTS IN AN ELEVATOR SYSTEM

Toshiaki Ishii, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

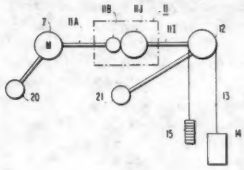
Filed Nov. 26, 1984, Ser. No. 674,632

Claims priority, application Japan, Dec. 13, 1983, 58-234882; Dec. 16, 1983, 58-237343

Int. Cl.[4] B66B *5/00*

U.S. Cl. 187—29 R **17 Claims**

1. In an elevator system including a drive motor (7), a sheave (12) carrying a cable (13) having an elevator cage (15) suspended from one end and a counterweight (14) suspended from another end, and a speed reduction mechanism (11) comprising a first helical gear (11B) fixed to an output shaft (11A) of the motor and a second helical gear (11J) fixed to an input shaft (11I) of the sheave and operatively meshing with the first gear, a method for reducing collision impacts due to backlash during transitions between power/driving and regenerative/driven modes of operation, comprising the steps of:



(a) detecting a separation between teeth of the first and second gears, and

(b) reducing the torque applied to the output shaft by the motor in response to the separation detection to attendantly reduce a relative speed difference between the output and input shafts and thereby soften collision impacts upon the re-engagement of the gear teeth.

4,616,734

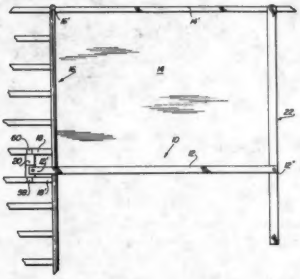
ROOF SCAFFOLDING

Philip Phelps, 1305 Eastern Dr., Urbana, Ill. 61801, and Ricky Rose, St. Joseph, Ill., assignors to Philip W. Phelps, Urbana, Ill.

Filed Sep. 20, 1984, Ser. No. 652,136

Int. Cl.[4] E04G *3/12*

U.S. Cl. 182—45 **17 Claims**



1. A firefighters' roof of scaffolding for use in forming ventilating holes in the roof of a building, which roof has a peak, comprising:

a cross beam of sufficient width to permit at least one firefighter to stand thereon to form at least one ventilating opening in the roof of a building, said cross beam having a first end and a second end;

a first attaching means mounted to said first end of said cross beam for attaching said first end of said cross beam to a first ladder emplaced on the roof to be ventilated, which first ladder is attached to the roof from the peak thereof and extends downwardly toward the lower edge of the roof; said first attaching means comprising a first mounting block, and ladder-rung holding means which firmly grip at least one rung of the ladder to attach said first end of said cross beam to the ladder; and

a second attaching means pivotally mounted to said second end of said cross beam for attaching said second end of said cross beam to one of a second ladder and a pole attached to the roof at a portion of the roof spaced from

the portion at which the first ladder is hung, said second attaching means comprising a second mounting block mountable to said second end of said cross beam in a plurality of relative positions so as to be able to fold the scaffolding during non-use and during carrying, and to readily and easily open up the scaffolding for use, means mounting said second attaching means for rotational movement relative to said second end of said cross beam in a plane parallel to a longitudinal side of said cross beam, means for firmly holding said second mounting block in each of said plurality of relative positions, and means attachable to said second mounting block for connecting said second end of said cross beam to one of the second ladder and the pole attached to the portion of the roof spaced along the peak of the roof from the portion thereof to which is connected the first ladder.

4,616,735

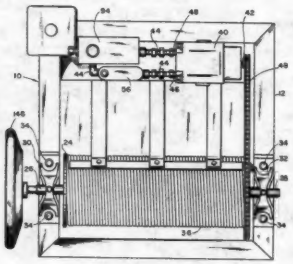
ESCAPE DEVICE FOR USE IN HIGH-RISE STRUCTURES

Orey C. Orgeron, 706 Souvenir Gate, Lafayette, La. 70506

Continuation-in-part of Ser. No. 477,143, Mar. 21, 1983, Pat. No. 4,520,900, which is a continuation-in-part of Ser. No. 438,035, Nov. 11, 1982, abandoned. This application Sep. 10, 1984, Ser. No. 648,770

Int. Cl.[4] A62B *1/02*

U.S. Cl. 182—238 **11 Claims**



1. A fire escape device for use in lowering persons from high-rise structures, comprising:

a frame;

a spool rotatably mounted on the frame;

a cable wound around the spool;

a first sprocket wheel fixed to the spool for rotation therewith;

a fluid pump mounted on the frame and provided with a second sprocket wheel, the diameter of the second sprocket being less than the diameter of the first sprocket wheel, the second sprocket wheel being provided with the means for moving fluid through a fluid circuit from a discharge side to a suction side of the pump when the second wheel rotates;

a drive chain around the first and second sprocket wheels for transmitting rotational movement between the first and second sprocket wheels;

person engaging means attached to the cable;

a pressure compensated flow control valve in the fluid circuit for maintaining a constant speed of revolution of the spool independently of a weight exerting a downward force on the engaging means, wherein said compensated flow valve comprises a valve body with an inlet and an outlet, the valve body being divided by a barrier into an inlet chamber and an outlet chamber, the barrier preventing flow of fluid from the inlet to the outlet, the barrier being provided with a passageway therethrough, a first opening between the inlet chamber and the passageway and a second opening between the passageway and the outlet chamber, a movable piston between the first and second openings, an increase of pressure in the inlet chamber moving the piston into at least partially obstructive relationship to the flow of fluid through the second opening, thereby slowing the flow of fluid through the fluid circuit and breaking descent of the engaging means, the degree to which the piston obstructs the second opening being proportional to the pressure in the inlet chamber, the piston is spring biased into normally non-obstructive relationship to the flow of fluid through the second opening, the bias of the spring being overcome by increased pressure on the inlet side of the barrier to move the piston into at least partially obtructive relationship to the flow of fluids through the second opening; and

means for selectively, at least partially, obstructing the flow of fluid through the first opening, wherein the means for at least partially obstructing the flow of fluid into the first opening comprises a rod having a hole-plugging end adjacent the first opening, and means outside the valve body for selectively moving the plugging end into obstructing relationship with the first opening, wherein a reverse fluid flow aperture is provided in the barrier, the aperture being closed by a plug during flow of fluids through the fluid circuit during descent of the engaging means, the plug being displaced during reverse flow of fluid when rewinding the cable around the spool, wherein the plug is normally spring biased into closing relationship with the aperture, the spring constant of the spring around the plug, being lower than the spring constant of the spring biasing the piston out of obstructing relationship to the second opening, so that the plug is displaced more easily against the bias of its spring than the piston moves against the bias of its spring.

4,616,736

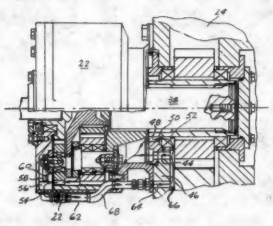
OIL SYSTEM FOR CONTIGUOUS GEAR BOXES

Charles H. Fox, Greenville, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jul. 25, 1985, Ser. No. 758,782

Int. Cl.[4] F01M *9/06*

U.S. Cl. 184—6.12 **5 Claims**



1. In a machine having gears in a first gear case contiguous to but separated by a common wall from and driven by gears in a smaller second gear case, an improved method of lubrication comprising the steps of:

a. forming an oil passage in said common wall between said first gear case and said contiguous second gear case,

b. forming an oil orifice in said second gear case remote from said wall oil passage,

c. forming an oil aperture in said first gear case,

d. connecting said second gear case oil orifice to said oil aperture of said first gear case externally of said gear cases,

e. forming a rotatable carrier in said second gear case, the periphery of which is adjacent to said oil orifice,

f. mounting a plurality of vanes on said carrier having outer ends for distributing oil throughout said second gear case, and

g. forming an internal projection on the inner periphery of said second gear case radially adjacent said outer ends of said vanes and adjacent to and circumferentially following

said oil orifice for forming a dam to catch oil distributed by said vanes to create a pressure head and force said oil out of said oil orifice thereby creating a pumping action which circulates said oil between said first and second gear cases through said external oil connection means and said oil passage coupling said first gear case to said second gear case whereby oil from a single oil supply is circulated between said gear boxes thereby eliminating the need for two separate oil supplies and enabling the oil in said second gear box to achieve lower operating temperatures than when operated with a separate oil supply.

4,616,737

BUFFER DEVICE

Makoto Orii, Nagano, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Continuation of Ser. No. 384,113, Jun. 1, 1982, abandoned. This application Dec. 3, 1984, Ser. No. 677,330
Claims priority, application Japan, Jun. 3, 1981, 56-81043[U]
Int. Cl.[4] B60T *8/02*
U.S. Cl. 188—184 **6 Claims**

1. A buffer device, comprising:

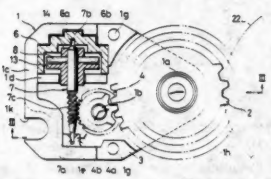
a first shaft having a worm portion;

a worm gear engaged with said portion;

a substantially planar damping member integrally formed of an elastic substance and connected to said first shaft at a central portion of said damping member, said damping member being outwardly openable and bending at an elastic portion of said damping member due to centrifugal force;

fixed sliding contact means with which said damping member contacts at, at least, two portions of said damping member when said damping member is opened outwardly, whereby rotation of said worm gear is frictionally damped; and

retaining means for holding said damping member;



wherein said retaining means comprises a planar retaining plate confronted with and spaced apart from movable outer portions of said damping member and contacting inner portions of said damping member, said contacting preventing rotation of said inner portions of said damping member with respect to said retaining plate.

4,616,738

DAMPED BORING BAR AND TOOL HOLDER

Norval E. Shurtliff, 87486 Cinnabar La., Veneta, Oreg. 97487

Filed Jul. 27, 1983, Ser. No. 517,665
Int. Cl.[4] B23B *29/02;* **F16F** *7/10*
U.S. Cl. 188—380 **6 Claims**

4. A damped tool-holding assembly comprising:

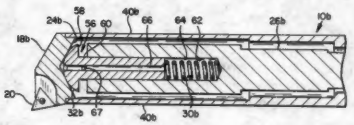
(a) a hollow, elongated case having a reach end and a shank end, the reach end being closed and having an inner front face and the shank end being open;

(b) tool-holding means on the reach end of the case;

(c) the inner front face of the closed reach end of the case providing a frictional bearing surface;

(d) within the case a weighted elongated damper body having a reach end and a shank end, the reach end having an axial bore therein;

(e) a cap piece comprising a stem having a reach end and dimensioned for sliding fit in said axial bore and extending longitudinally beyond and spaced from the reach end of the damper body and having a cap on the reach end provided with a frictional bearing surface positioned for laterally slidable frictional engagement with the frictional bearing surface on the inner front face of the closed reach end of the case; and



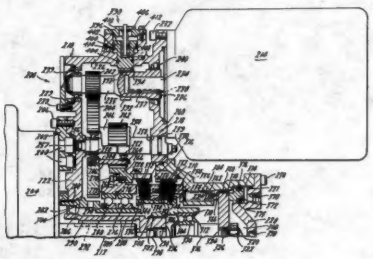
(f) a spring directly engaging both the damper body and the cap piece for pressing the frictional bearing surface on the reach end of the cap against the frictional bearing surface on the inner front face of the closed reach end of the case.

4,616,739

INCHING DRIVE

Gordon M. Sommer, Boca Raton, Fla., assignor to Sommer Co., Warren, Mich.

Continuation-in-part of Ser. No. 403,300, Jul. 30, 1982, Pat. No. 4,494,635. This application Aug. 3, 1983, Ser. No. 521,243
The portion of the term of this patent subsequent to Jan. 22, 2002, has been disclaimed.
Int. Cl.[4] F16D *67/04*
U.S. Cl. 192—18 A **7 Claims**



2. An inching drive unit for an apparatus having a housing, and a main rotatable member operably associated with said housing, said housing having a first portion having an interior portion, said inching drive unit comprising:

inching motor means for driving said inching drive unit, having a drive shaft extending therefrom;

a second portion of said housing secured to said inching motor means, said drive shaft of said inching motor means extending into said second portion of said housing;

first gear means disposed within said second portion of said housing and fixedly secured to said inching motor drive shaft;

a second member rotatably disposed within said second portion of said housing and extending into said first portion of said housing;

second gear means disposed within said second portion of said housing on said second member and operably engageable with said first gear means to be driven by said first gear means and thereby drive said second member;

third gear means also disposed on said second member spaced apart from said second gear means and disposed within said first portion of said housing;

fourth gear means operably associated with said main rotatable member of said apparatus; and

means for selectively engaging said third gear means with said fourth gear means wherein engagement of said third gear means with said fourth gear means permits said inching motor means to drive said main rotatable member of said apparatus.

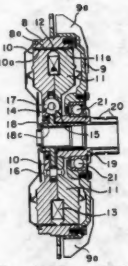
4,616,740

MAGNETIC PARTICLE TYPE ELECTROMAGNETIC COUPLING APPARATUS

Kiyohide Okamoto, Himeji, and Ryosuke Okita, Aioi, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1984, Ser. No. 685,795
Claims priority, application Japan, Dec. 26, 1983, 58-249072
Int. Cl.[4] F16D *37/02, 3/12, 3/66*
U.S. Cl. 192—21.5 3 Claims

1. A magnetic particle type electromagnetic coupling apparatus characterized by comprising a first coupling body having a coupling surface at its inner circumferential part, a second coupling body constituted by two members divided in the axial direction which is placed inside the coupling surface of said first coupling body and has a coupling surface connectable to said coupling surface of said first coupling body, magnetic particles filled between said coupling surfaces, an electromagnetic coil received in said second coupling body to magnetize said magnetic particles thereby controlling connection between said coupling surface, a rotary body including a rotary plate placed at the inner circumferential part of said second coupling body and extending between said two members of the second coupling body with predetermined air gaps and having



elongated holes extending in the circular direction at parts facing said two members, connecting pieces passing through said elongated holes to connect said two members of the second coupling body to said rotary plate, so as to transmit torque, said connecting pieces being supported at both ends by said members so as to reduce the stress on said connecting means and a damper means which is placed between said second coupling body and said rotary body so as to transmit torque and which is sealingly held between said two members of said second coupling body, wherein torque is transmitted only through said dampers until said dampers are compressed by a predetermined amount and then torque is transmitted through said connecting pieces, so as to reduce stress on said connecting pieces.

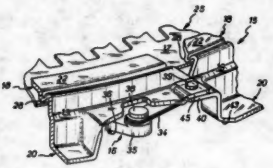
4,616,741

CLUTCH COVER ASSEMBLY

René Billet, Allée des Cerfs Résidence Beaularris, 60620 Lamorlaye, France, assignor to Valeo, Paris, France

Filed May 10, 1985, Ser. No. 732,572
Claims priority, application France, May 15, 1984, 84 07468
Int. Cl.[4] F16D *13/50, 13/71*
U.S. Cl. 192—70.18 14 Claims

1. Clutch cover assembly comprising an annular cover adapted to be attached to a reaction plate, an annular pressure plate rotationally coupled to said cover and movable axially relative to said cover, and axially acting elastic means bearing on said cover and continuously urging said pressure plate away from said cover, wherein said cover is circumferentially di-



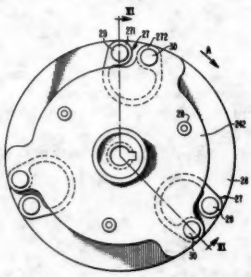
vided into separate sectors and means are provided whereby said sectors overlap.

4,616,742

SPRING COUPLING FOR AN ELECTROMAGNETIC CLUTCH

Takashi Matsushita, Isesaki, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Mar. 30, 1983, Ser. No. 480,286
Int. Cl.[4] F16D *19/00, 27/00*
U.S. Cl. 192—84 C 5 Claims



1. In an electromagnetic clutch including a first rotatable member having an axial end plate of magnetic material, a second rotatable member, an annular armature plate of magnetic material joined to said second rotatable member so that said annular armature plate is capable of limited axial movement, said annular armature plate facing said axial end plate of said first rotatable member with an axial air gap therebetween, and an electromagnetic means associated with said axial end plate for attracting said armature plate to said axial end plate so that rotation of said first rotatable member can be transmitted to said second rotatable member through said armature plate by the operation of said electromagnetic means, the improvement comprising:

said second rotatable member including a drive shaft, a hub fastened to the end of said drive shaft and a radially extending flange mounted on said hub;

a plurality of spring members coupling said annular armature plate to said radially extending flange, each of said spring members having first fitting means coupling said spring member to said annular armature plate and second fitting means coupling said spring member to said radially extending flange, said first and second fitting means being positioned opposite each other at a predetermined gap for preventing excessive bending of said spring members when the predetermined gap is closed by the initial rotation of said annular armature plate in response to the operation of said electromagnetic means and said first rotatable member, said excessive bending being prevented by said first and second fitting means contacting each other.

4,616,743

CENTRIFUGAL CLUTCH PARTICULARLY USEFUL IN TRANSPORT REFRIGERATION UNIT

Robert K. Havemann, Bloomington, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Jan. 11, 1985, Ser. No. 690,718
Int. Cl.[4] F16D *43/18*
U.S. Cl. 192—105 BA 7 Claims

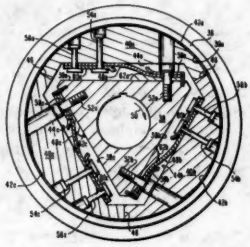
1. A centrifugal clutch having the capability of absorbing driving torque peaks from a driver, said clutch comprising:

a clutch drum having an internal annular surface;

a hub in said drum connected to be rotatably driven by said driver in one direction only;

a plurality of friction shoes between said hub and drum, each shoe having a radially outer surface for contacting said internal surface of said drum, and a radially inner surface;

the periphery of said hub comprising a plurality of successive surface areas corresponding in number to the plurality of said shoes; and



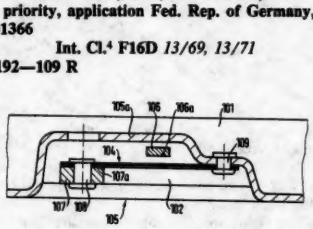
a single leaf spring connecting each shoe to each said surface area, each spring being located between one of said surface areas of said hub and the facing part of said radially inner surface of said shoe, each said spring having one portion connected to the leading end portion, relative to said direction of rotation, of the respective surface area facing said shoe, and having the opposite end portion connected to a more trailing portion, relative to said direction of rotation, of said radially inner surface of said shoe, said single leaf spring being the sole connection between each shoe and said hub.

4,616,744

FRICTION CLUTCH UNIT WITH A STOP ELEMENT FOR LIMITING PRESSER PLATE TRAVEL

Dagwin Tomm, Kaiserslautern; Dieter Kolb, Bad Kissingen; Siegmund Gehrig, Arnstein-Binsfeld, and Alfred Meyer, Schweinfurt, all of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Jan. 14, 1985, Ser. No. 691,270
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1984, 3401366
Int. Cl.[4] F16D *13/69, 13/71*
U.S. Cl. 192—109 R 4 Claims



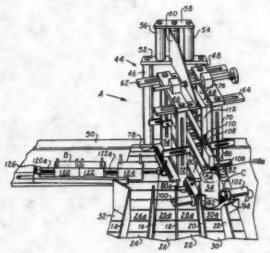
1. A friction clutch unit such as for motor vehicles, comprising a clutch housing (1) having an axis and adapted for being fixed to a driving disc (10), a presser plate (2) connected to said clutch housing (1) for common rotation therewith about said axis and for limited axial movement with respect to the clutch housing (1), main spring means (14) supported by said clutch housing (1) and engaging said presser plate (2) such as to urge said presser plate (2) towards a clutch disc (16) and said clutch disc (16) towards a friction face (18) of said driving disc (10), said presser plate (2) being connected to said clutch housing (1) by a plurality of leaf spring elements (4) which are substantially tangential with respect to said axis and are fixed by a first respective end (4*a*) to said clutch housing (1) and by a second respective end (4*b*) to said presser plate (2), travel limiting means being provided for limiting the axial travel of said presser plate (2) away from said clutch housing (1) under at least one of gravitational force and the action of said main spring means (14), said travel limiting means comprising at least one stop element (6) fixed to said presser plate (2) and located axially on the side of at least one of said leaf spring elements remote from said driving disc (10) and in tangential direction between said first (4*a*) and second (4*b*) ends of the respective leaf spring elements (4), said stop element (6) being axially spaced from the respective leaf spring element (4) in operation of the clutch and abutting said leaf spring element (4) on axial travel of said presser plate (2) away from said clutch housing (1) when said clutch housing is separated from said driving disc (10).

4,616,745

APPARATUS FOR ALIGNING AND FEEDING ARTICLES UPRIGHT ON AN ARTICLE LOADING MACHINE

Robert G. Hartness, 1720 Hudson, Greer, S.C. 29651

Filed Mar. 26, 1984, Ser. No. 593,574
Int. Cl.[4] B65G *47/26*
U.S. Cl. 198—442 14 Claims



1. For use in an article loading machine of the type having a conveyor on which articles are conveyed, a plurality of parallel plates spaced across a width of the conveyor defining parallel lanes therebetween through which the articles are conveyed in separated parallel rows, apparatus for automatically feeding the articles into parallel lanes comprising:

pivoting guide chute means carried by said article loading machine adjacent said conveyor for receiving the articles conveyed on the conveyor and holding the articles in a single file row;

said pivoting guide chute means having an inlet end through which said articles are received and an outlet end from which said articles are fed into said lanes;

indexing drive means for sequentially moving said pivoting guide chute means in a lateral motion across the width of the conveyor to successively position said outlet end of said pivoting guide chute means adjacent an entrance end of each said lane;

releasable feed means means carried adjacent said outlet end of said guide chute means for engaging and retaining an article in a feed position in said chute until said chute reaches a discharge feed position adjacent said entrance of each said lane, said releasable feed means including:

(i) upper fixed rail means for contacting an upper portion of said article;

(ii) upper stop means for positioning said upper portion of said article adjacent said upper fixed rail means; and

(iii) lower oppositely moving stop means for contacting a

lower portion of said article on opposite sides thereof for a non-tilting arresting of said article therebetween;

actuation means included for opening said releasable feed means and feeding an article into said lane upon said pivoting guide chute means reaching one of said discharge feed positions;

said actuation means closing said releasable feed means to positively hold a next remaining article in said guide chute means in said discharge feed position while said pivoting guide chute means is moved to a next adjacent discharge feed position at an entrance end of the next adjacent lane; and

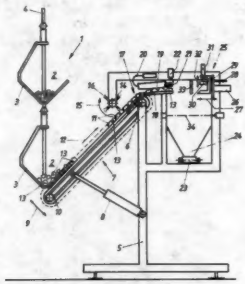
said indexing drive means including a plurality of air cylinders being connected serially together to advance said pivoting guide chute means across said conveyor.

4,616,746

APPARATUS FOR REMOVING STRIPS FROM COMPARTMENTS

Peter Lisec, Bahnhofstrasse 34, 3363 Amstetten-Hausmening, Austria

Filed Jul. 27, 1984, Ser. No. 635,437
Claims priority, application Austria, Sep. 5, 1983, 3166/83
Int. Cl.[4] B65G *47/14, 47/52*
U.S. Cl. 198—463.3 **10 Claims**



1. Apparatus for the removal of strips from a compartment wherein the strips are disposed horizontally, comprising an inclined conveyor (7) having an upper end and a lower end, said lower end being disposed in the vicinity of said compartment (2) to engage strips (13) in the compartment and raise the strips to said upper end, means (18) at said upper end of the conveyor for lifting strips off the conveyor and for forming an advancing series of strips (13), a further conveyor (23), and means (25) for removing strips from said lifting means and for depositing said removed strips on said further conveyor, said removing means (25) comprising gripper means that grasp the most advanced strip of said series of strips (13) on said lifting means (18) and move said most advanced strip transverse to the length of said strips off said lifting means, and a stop (33) arranged in the path of movement of the strips to contact said most advanced strip and remove said most advanced strips from said gripper means after which said most advanced strip falls onto said further conveyor (25), said lifting means (18) comprising a plurality of curved rails that receive said strips (13) transverse to the length of the rails, and a pressure member (19) spring urged toward the upper surface of each of said curved rails, the strips forcing each other into said series between said curved rails and said pressure member.

4,616,747

HAIR PIECE STORAGE AND CARRYING CASE

Marlin Zimmerman, 807 Williams Charles Ct., Apt. K, Green Bay, Wis. 54304

Filed Aug. 30, 1985, Ser. No. 771,501
Int. Cl.[4] A45C *11/02;* B65D *25/10, 85/18*
U.S. Cl. 206—8 **5 Claims**

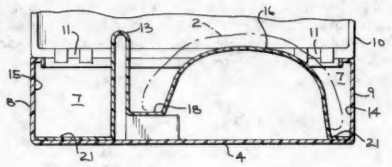
1. A hairpiece storage and carrying case, comprising:

a housing having a bottom wall, a plurality of upright side walls and a lid defining a hollow interior;

a divider for partitioning said hollow interior into a hairpiece-receiving compartment and an implement-receiving compartment;

a frame member disposed in said hairpiece-receiving compartment dimensioned to substantially conform to the shape of a human skull for supporting a hairpiece having front, rear and side portions thereon so that said front portion of said hairpiece is disposed between said frame member and said divider and said rear and side portions of said hairpiece are disposed between side frame member and said side walls; and

a landing interconnecting said frame member and said divider and defining a support surface in spaced relationship from said bottom wall to support the front portion of the hairpiece at a desired height above that of the sides and rear of the hairpiece to maintain the hairpiece in a simulated natural style of arranging hair.

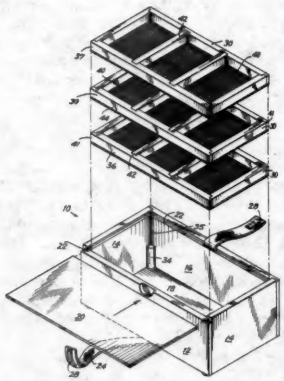


4,616,748

CONTAINER FOR ARTIST'S PASTELS

Warren R. Thomas, and Edna H. Thomas, both of 32 Park St., Johnson City, N.Y. 13790

Filed Dec. 31, 1984, Ser. No. 687,793
Int. Cl.[4] A45C *11/34*
U.S. Cl. 206—214 **7 Claims**



1. An outer container for cleaning artist's pastels while storing or transporting them which comprises:

side, front and rear walls, a top and a bottom, the top being movable away from, and toward, the rear wall to at least partially open and to close the outer container;

means for supporting at least a first inner tray container above the bottom of the outer container; the first inner tray container being vertically removably supported on the supporting means and having a fully open top and an open mesh bottom adapted to hold a plurality of pastels thereon;

a freely flowing, granular abrasive below the first inner tray container;

the fully open top and mesh bottom of said first inner tray

container comprising means for passage of the granular abrasive therethrough for cleaning the pastels thereon;

the top of the outer container comprising, when closed, means for retaining the granular abrasive in the outer container; and for restraining the first inner tray container from moving substantially away from the bottom of the outer container and for restraining the pastels within the first inner tray container from moving substantially away from the open mesh bottom of the first inner tray container when the outer container is inverted;

whereby the outer container constitutes means for storing the transporting pastels and is adapted to be inverted so that the granular abrasive passes through the open mesh bottom of the first inner tray container and around, and in abrasive contact with, the pastels to clean them while storing or transporting them.

4,616,749

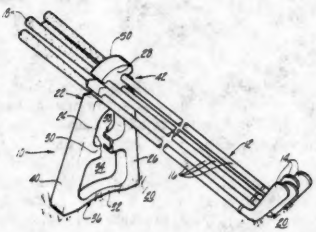
GOLF CLUB CARRIER AND HOLDER

Cyril F. Briggs, 1450 Inverness, Adrian, Mich. 49221

Filed Jan. 17, 1985, Ser. No. 692,404

Int. Cl.⁴ A63B *55/00*

U.S. Cl. 206—315.2 **5 Claims**



1. A golf club carrier for transporting and retaining a plurality of golf clubs each having a club head, a shaft and a grip, said grip being of a layered cross-section across the end of said shaft, said carrier comprising:

a body having a pair of downwardly extending legs, each leg having a first end and a second end, said first ends of said legs being joined at an apex at a top of said body and at least one lateral support extending between said legs wherein said legs and said support form first and second surfaces of said body and a peripheral edge, each leg further comprising an elongated planar portion;

said body being of a one piece molded construction,

means formed in said body for retaining a plurality of golf clubs, said retaining means comprising a plurality of notches formed in said peripheral edge, said notches being generally perpendicular to said first and second surfaces and wherein said notches extend through said body, said notches being formed at said apex of said body so that either leg can be freely grasped between said retaining means and said first end of said either leg;

wherein said planar portion of each leg extends continuously from said retaining means to said second end of each leg and forms a means for grasping and transporting said carrier, said grasping and transporting means being integrally formed in said body;

said notches having a cross-sectional area to disengagingly receive said shaft of said club but to engage said grip to retain said club when said club is moved in a longitudinal direction to bring said grip into said retaining means

wherein with the grips of golf clubs positioned in said notches and said carrier positioned on a ground support surface, said carrier together with said clubs form a stand in which said second ends of said legs and the club heads of the clubs abut against and are supported by the ground surface.

4,616,750

CONTAINER FOR THE STORAGE OF PHOTOGRAPHIC FILMS AND THE LIKE

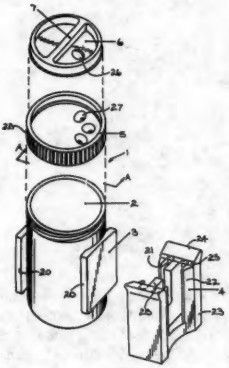
Bart Nouwen, Edelfalter 11, D-4044 Kaarst, Fed. Rep. of Germany

Filed Mar. 30, 1984, Ser. No. 595,308

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1983, 3312064

Int. Cl.⁴ B65D *85/671*

U.S. Cl. 206—316 **19 Claims**



1. A container assemblage for the storage of photographic films, film cartridges, film spools and the like comprising:

a pair of hollow cylindrical container bodies suitable for receiving films, cartridges or spools, said container having, on diametrically oppositely lying positions on its outer surface, projecting locking members;

a coupling element interposable between said container bodies for engaging said locking members, said coupling element arranging said container bodies along a common diametral line with which coupling element lying between the container bodies on said diametral line;

each of said projecting locking members of said container bodies comprising a pair of locking sections engageable with a mating pair of locking sections of said coupling element, said locking sections of said container bodies and coupling element being spaced from each other in a direction normal to said diametral line, said locking sections on said container bodies comprising a circumferentially spaced pair of ridges (12) projecting from the outer surface of said container bodies for forming locking grooves (41) between said ridges and the container body outer surface, said locking grooves formed between said ridges and said container body outer surface subtending acute angles, said coupling element having mating corners (13) insertable in said grooves; and

a container cover for each of said bodies, said cover being sealable to the respective container body, said cover having a rotatable indicator for indicating the condition of the contents of said container body.

4,616,751

SLEEVE FOR PROMOTIONAL PRODUCTS

Hampton E. Forbes, Jr., Wilmington, Del., assignor to Westvaco Corporation, New York, N.Y.

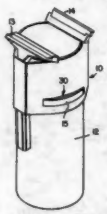
Filed Sep. 10, 1982, Ser. No. 416,643

Int. Cl.⁴ B65D *73/00*

U.S. Cl. 206—485 **5 Claims**

1. In combination, a primary container and a display sleeve telescoped over and extending around said primary container said primary container comprising a can and lid of generally round configuration in cross section and adapted to be dis-

posed in an upright manner, said lid including a peripheral flange located near an end thereof and spaced from the top of the lid, and a display sleeve of generally elliptical configuration in cross section, formed from a single blank of foldable material and comprising at least two elongated main penels of substantially rectangular shape and a glue flap foldably attached to one main panel and adhered to the end of the other main panel, the height of all panels of said display sleeve being greater than the nominal height of said primary container lid, said display sleeve including at least one pair of locking slots located in the main panels near the lower edges thereof, said locking slots



extending over a major portion of the length of said main panels and having a width dimension substantially equal to the width of said primary container lid flange, wherein with the display sleeve telescoped over said primary container lid, said locking slots become engaged with said peripheral flange to retain said display sleeve on said primary container, and spaces are formed at each end of said display sleeve between the generally round edges of said primary container lid portion and the ends of the elliptically shaped display sleeve for accomodating and retaining one or more promotional products with said primary container.

4,616,752

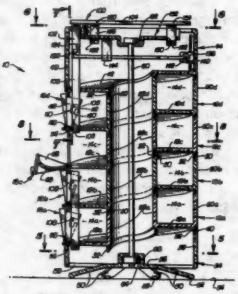
PILL DISPENSER

Brad Ridgley, 16400 Ventura Blvd., #233, Encino, Calif. 91436

Filed Oct. 30, 1984, Ser. No. 666,550

Int. Cl.[4] B65D *83/04*

U.S. Cl. 206—533 **16 Claims**



1. A container for storing and dispensing pills comprising:

a wall defining an interior space within which pills are stored, said wall further defining an aperture providing access to the interior space; and a spiral-shaped downward sloping floor positioned relative to the aperture for supporting and guiding the pills to the aperture.

4,616,753

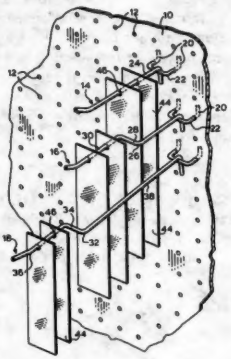
PEGBOARD HANGERS

Ozay Aslan, Brampton, Canada, assignor to Cochrane-Dunlop Limited, Etobicoke, Canada

Filed Oct. 15, 1985, Ser. No. 787,187

Int. Cl.[4] A47F *7/00*

U.S. Cl. 211—57.1 **2 Claims**



1. A package-display apparatus comprising a base having a plurality of holes arranged in equispaced horizontal and vertical rows, a plurality of vertically-aligned bracket rods having mounting means at one end for attaching said rods to the base, said rods each having a distal end extending in a direction away from the base, the uppermost rod of said plurality of rods being linear and mounted in a first pair of vertical rows of holes, each successively lower bracket rod beinq mounted in a pair of vertical rows of holes laterally offset at least one row of holes from said first pair of vertical rows of holes, said successively lower rods having lateral, horizontally offset portions formed in the distal ends progressively more distant from the base whereby merchandise supported on said rods on the horizontally offset distal portions thereof are vertically aligned in horizontal rows more distant from the base at progressively lower levels.

4,616,754

MANUFACTURE OF TRAY HOLDER FROM SINGLE MOLDED ARTICLE

Burno Heinzl; Herbert Frowein; Hartmut Stiegler, all of Herborn; Joachim Würz, Driedorf; Horst Schmidt, Trinkenstein; Willi Huttel, Ehringshausen, and Karl-Heinz Schmitz, Herborn-Seelbach, all of Fed. Rep. of Germany, assignors to Buderus Aktiengesellschaft, Wetzlar, Fed. Rep. of Germany

Filed Mar. 27, 1984, Ser. No. 593,874

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1983, 8309164[U]

Int. Cl.[4] A47G *29/00*

U.S. Cl. 211—71 **8 Claims**

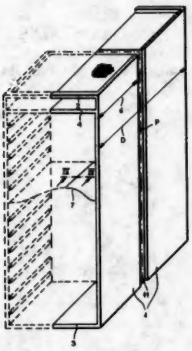
1. An article for making a tray holder, the article comprising:

a generally rectangular side panel having upper and lower edges and inner and outer faces;

a generally rectangular roof panel projecting generally perpendicularly from the inner face of the side panel along the upper edge thereof; and

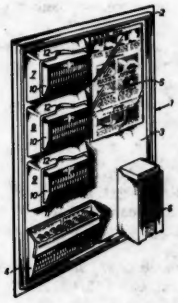
a generally rectangular floor panel projecting generally perpendicularly from the inner face of the side panel along the lower edge thereof, the panels being unitary and formed along a plane perpendicular to and bisecting all panels with a weakened region, the roof and floor panels having straight outer edges remote from the side panel that have a predetermined male profile to one side of the

plane and a complementary female profile to the opposite side of the plane, whereby the article can be subdivided at



the region into two complementary and interfitting pieces along the plane and joined together to make a holder by bonding together the complementary outer edges.

4,616,755
MEANS FOR WALL BOARDS
Roger Adolfsson, Stockholm, Sweden, assignor to Cederroths AB, Sweden
Continuation of Ser. No. 386,023, Jun. 7, 1982. This application May 4, 1984, Ser. No. 607,150
Int. Cl.[4] A47F *5/08*
U.S. Cl. 211—89 **10 Claims**



1. In combination:

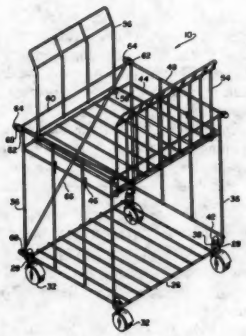
(A) a board for displaying and releasably holding articles such as medical articles, said board comprising:

(1) a generally flat rear sheet having a shape which permits it to be hung on a wall;

(2) a plurality of compartments extending outwardly from a front surface of said sheet, each of said compartments being defined by a rear wall lying generally parallel to said rear sheet and four smooth planar side walls extending from said rear wall in a direction generally perpendicular to the plane of said flat rear sheet and defining an open parallelepiped recess; and

(B) at least one medical article, each said article being located in a respective said compartment, each said article having a shape which allows it to be snuggly received in its said respective said compartment, the rigidity of said side walls of each said compartment being greater than the rigidity of its respective said article such that each of said articles is elastically deformed by said side walls and is held in its said respective compartment by the friction force resulting from the compressive forces exerted on said rigid side walls of said respective compartment by the said elastically deformed article located therein, the depth of each of said article as measured in a direction perpendicular to said rear surface being greater than the depth of its respective said compartment such that said articles extend outwardly from their respective compartments along substantially the entire periphery of it's respective compartments and can easily be grasped from a position in front of said compartment, the side walls of each said article contacting substantially the entire surface of said side walls of its respective compartment.

4,616,756
READILY ASSEMBLED TWO-SHELF CART
Gilbert J. Holtz, 188 Tibbetts Rd., Yonkers, N.Y. 10705
Filed Apr. 26, 1984, Ser. No. 604,240
Int. Cl.[4] A47F *5/01*
U.S. Cl. 211—181 **3 Claims**



1. A readily assembled two-shelf cart adapted in said assembled condition to store and receive fan-folded computer paper comprising, in combination, a rectangular horizontally oriented lower shelf having an extending eyelet at each corner for supporting a shelf for said fan-folded computer paper thereon, a pair of vertically oriented side walls each having inwardly extending eyelets at opposite ends along their bottom edge in aligning relation to said eyelets of said lower shelf, casters at each corner of said cart each having an upstanding axle adapted to be secured in a projected relation through said aligning eyelets of said lower shelf and side walls for partially completing the assembly of said cart, and hook means provided inwardly of each of said side walls and an upper shelf engaged therein so as to be supported in spanning relation between said side walls, whereby the engagement of said upper shelf between said side walls completes the assembly of said cart and provides a support for said computer paper after the imprinting thereof.

4,616,757
THREE AXIS CORNER BRACKET
Willis S. Hobson, Columbus, Ind., assignor to Seymour Manufacturing Company, Seymour, Ind.
Filed Nov. 9, 1984, Ser. No. 669,827
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—189 **15 Claims**

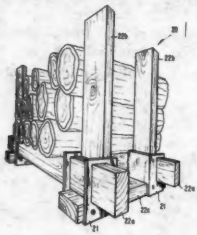
1. A corner bracket for use as a part of a support system wherein a plurality of said brackets is used in combination with connecting members to complete said system, said corner bracket comprising:

a three-sided hollow frame member having first and second sides facing each other and a third side disposed between said first and second sides;

said first side being designed and arranged to define a first opening, said first opening being suitably sized and shaped for receipt of a first connecting member;

said second side being designed and arranged to define a second opening, said first and second openings being aligned with each other and being of a similar shape;

said third side defining in combination with said first and



second sides, a channel which is suitably sized and shaped for receipt of a second connecting member, and said third side further defining a third opening, said third opening being suitably sized and shaped for receipt of a third connecting member; and

said third opening being of a shape similar to said first and second openings all of said openings being of a shape similar to said channel.

4,616,758

INSULATING CONTAINER, IN PARTICULAR INSULATING BOTTLE

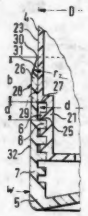
Anso Zimmermann, Bad Hersfeld, Fed. Rep. of Germany, assignor to Rotpunkt Dr. Anso Zimmermann, Niederaula, Fed. Rep. of Germany

Filed Feb. 22, 1985, Ser. No. 704,633

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1984, 8407009[U]

Int. Cl.[4] A47J *41/00*

U.S. Cl. 215—13 R **3 Claims**



1. In an insulating container, in particular an insulating flask, with a vacuum glass insert and a hollow cylindrical housing surrounding the latter, which housing consists basically of an upper housing part and a lower housing part, in the form of a base with a raised-up edge and at least one supporting means for the arrangement and mounting of the vacuum glass insert, wherein the upper housing part and the edge of the base are provided with a screw thread and are screwed together until the supporting means is arranged on the vacuum glass insert, wherein the upper housing part has an outer screw thread and the inner screw thread is formed on the edge of the base and wherein a cover ring is provided, which covers an unused area of the outer screw thread; the improvement comprising in that the cover ring is formed by a single-piece extension of the edge of the base, the cover ring overlaps the upper housing part beyond the outer screw thread, the covering being internally dimensioned so as to roughly closely surround the upper part of the housing, and the free end of the cover ring converges conically into the housing wall.

4,616,759

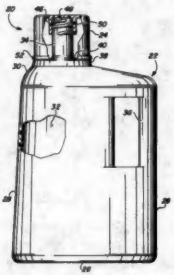
LIQUID-DISPENSING CONTAINER ASSEMBLY

Darrell Mahler, 2600 Hodgson Cir., Topanga, Calif. 90290

Filed Nov. 8, 1985, Ser. No. 796,167

Int. Cl.[4] B65D *51/24*

U.S. Cl. 215—228 **9 Claims**



1. An improved cap-containing, liquid-dispensing container assembly, said assembly comprising, in combination:

(a) a container having interconnected bottom, side and top walls defining a hollow interior storage space, said top wall having an upstanding liquid-dispensing pour spout communicating with said storage space, a raised cap base-receiving annular platform disposed peripheral of the base of said spout, and a recessed liquid drainage channel between said platform and said spout, said channel including a bottom drain hole communicating with said storage interior;

(b) a measuring cap disposed over and releasably secured to said spout by first sealing means, the base of said cap abutting said platform; and,

(c) second sealing means releasably sealing said cap base to said platform.

4,616,760

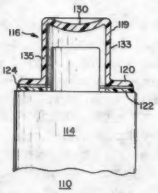
PORT AND CLOSURE ASSEMBLY FOR A CONTAINER

Jean Kersten, Villers St. Amand, and Jean M. Mathias, Nivelles, both of Belgium, assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jan. 30, 1985, Ser. No. 696,567

Int. Cl.[4] B65D *41/02*

U.S. Cl. 215—232 **12 Claims**



1. A port and closure assembly for a container comprising:

a port having a neck portion;

a closure for sealing the port having a cup shaped construction and including a body member having a top portion and sidewalls, and a rim member, the cross-sectional width of the top portion being greater than the cross-sectional width of the sidewalls and the rim member having a bonded thereto an interface layer, the interface layer

being bonded to the neck portion of the port when the closure seals the port; and

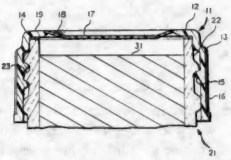
the bond strength of the interface layer to the rim member of the closure being less than the bond strength of the interface layer to the neck portion of the port so that when the sidewalls are compressed together the interface layer delaminates from the rim member of the port and the closure may be removed from the port.

4,616,761

VACUUM INDICATING THERMOPLASTIC CLOSURE

James F. Nolan, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 19, 1984, Ser. No. 673,063
Int. Cl.[4] B65D *41/04*
U.S. Cl. 215—271 **20 Claims**



1. In combination with a container containing a vacuum-packed product therein and having a finish portion for receiving a closure to close and seal said container, a closure sealingly engaging the finish portion of said container, said closure comprising, in combination: a top portion spanning the finish of the container; and an annular skirt extending downwardly from the top portion over the upper portion of the finish and securely engaging said finish, said top portion being formed from a generally planar thermoplastic material and comprising a circular inner portion, an annular portion surrounding said circular inner portion and a second annular portion surrounding said first annular portion, said circular inner portion, said first annular portion and said second annular portion being integrally formed in one piece with the circular inner portion being hinged to said first annular portion and the first annular portion being hinged to said second annular portion, the plane of said generally planar circular inner portion being movable with respect to the plane of the second annular portion from a first dimensionally stable postion when there is a vacuum in the container to a second dimensionally stable position when there has been a loss of the desired vacuum in the container, with the second dimensionally stable position being higher in elevation than the first dimensionally stable position when the container is in its normal upright position.

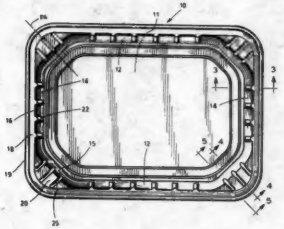
4,616,762

DISPOSABLE COOKING PAN

Frederick D. Alexander, Arlington Heights, Ill., assignor to Ekco Products, Inc., Wheeling, Ill.

Filed Apr. 2, 1985, Ser. No. 719,262
Int. Cl.[4] B65D *8/08, 1/39, 1/42*
U.S. Cl. 220—74 **3 Claims**

1. A disposable cooking pan formed from a single sheet of thin gauge metal, comprising a bottom panel; a continuous wall panel encompassing said bottom panel and extending upwardly and outwardly from the periphery thereof; and a continuous rim encompassing an upper edge portion of said wall panel and projecting laterally outwardly therefrom; said rim including a substantially planar inner section and a bead-like outer section, the outer section encompassing a multilateral area including the inner section, said inner section having relatively spaced enlarged areas disposed adjacent corner-forming portions of said outer section, said enlarged areas being provided with elongated strengthening ribs extending towards the upper edge portion of said wall panel; wherein each strengthening rib formed in the enlarged areas of the rim inner section includes a first segment declining at a first angle from adjacent the rim outer section towards the wall panel and terminating a predetermined distance from the wall panel, and a second segment



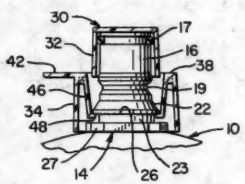
declining at a second angle from the termination of said first segment to the wall panel, said second angle being greater than said first angle, said second segment terminating at the wall panel at a location substantially below the upper edge portion of the wall panel.

4,616,763

TAMPER-EVIDENT DISPOSABLE CAP FOR CONTAINER VALVE PLUG

Gerald F. Ruhl, Greenville, Ohio, assignor to Replicap Products, Inc., Greenville, Ohio

Filed Dec. 3, 1985, Ser. No. 804,684
Int. Cl.[4] B65D *41/32*
U.S. Cl. 220—270 **16 Claims**



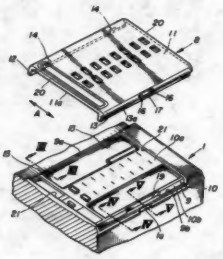
1. A protective one-piece tamper-evident cap for mouting on a valve plug projecting from a fluid container, said cap being molded of a plastics material and comprising an inverted cup-shaped upper cover portion having an annular wall completely surrounding the plug and being closed by a top wall, said cap further including an annular lower skirt portion projecting downwardly from said upper cover portion and being larger in cross-section than said cover portion, a plurality of peripherally spaced frangible ties integrally connecting said upper cover portion to said lower skirt portion, a plurality of peripherally spaced spring fingers integrally connected to said lower skirt portion outwardly of said frangible ties and positioned to engage the valve plug, and means for separating said lower skirt portion and said fingers from said upper cover portion by breaking said frangible ties in response to a force manually applied to one of said portions of said cap to provide access to the valve plug.

4,616,764

CASE HAVING SNAP-ON COVER

Yoshihiro Utoh; Shinichi Shibata, both of Hino, and Hiroyuki Kitahara, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Dec. 2, 1985, Ser. No. 803,735
Claims priority, application Japan, Nov. 30, 1984, 59-251555
Int. Cl.[4] B65D *41/16, 41/18*
U.S. Cl. 220—306 7 Claims



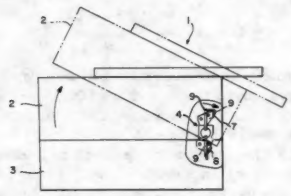
1. A case comprising:
a cover;
a main body of said case, said main body having a concave portion to which said cover is mounted;
first engaging means for preventing one edge of said cover from moving away from one side wall of said concave portion;
second engaging means for preventing another edge, of said cover opposing to said one edge from moving away from another side wall of said concave portion opposing to said one side wall; and
positioning means for preventing, in the vicinity of said another side wall of said concave portion, said cover from moving toward said one side wall of said concave portion.

4,616,765

HINGE STRUCTURE WITH TORSION BAR FOR ELECTROPHOTOGRAPHIC COPYING MACHINE

Tutomu Katoh, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 7, 1985, Ser. No. 785,216
Claims priority, application Japan, Oct. 12, 1984, 59-155582[U]
Int. Cl.[4] B65D *43/24*
U.S. Cl. 220—335 5 Claims



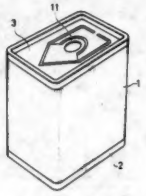
1. An electrophotographic copying machine comprising:
first body means accommodating parts of the electrophotographic copying machine;
second body means accommodating the other parts of the copying machine;
torsion bar means for stressing said first body means in a predetermined direction; and
adjustment means provided for controlling the stressing force of said torsion bar means.

4,616,766

CAN-LIKE CONTAINER

Otohiko Miyauchi; Michihiro Ohkawachi, and Junji Yotsuyanagi, all of Kanagawa, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 17, 1984, Ser. No. 661,747
Claims priority, application Japan, Oct. 17, 1983, 58-192452; Oct. 18, 1983, 58-193439
Int. Cl.[4] B65D *1/34*
U.S. Cl. 220—450 18 Claims



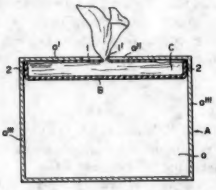
1. A can-like container comprising:
a container body having side walls and a bottom, said container body being formed of a single multi-layer sheet composed of at least a metal foil layer and a hot-melt resin layer formed on at least one side of said metal foil layer, said metal foil layer having a thickness of no more than 40 m, at least margin portions of said container body containing folds in side wall portions thereof;
a cover made of a multi-layer sheet compsed of at least a metal foil layer and a hot-melt resin layer formed on one side of said metal foil layer, at least peripheral portions of said hot-melt resin layer of said cover being heat-sealed to said hot-melt resin layer of said container body; and
a tray injection molded directly to the outer surface of said container body, said tray enclosing at least a lower portion of the outer surface of said container body.

4,616,767

TISSUE PAPER BOX

Mitsuro Seido, 26 Ooaza Maemachi, Kuroishi-shi, Aomori-ken, Japan

Filed Jun. 8, 1984, Ser. No. 618,610
Claims priority, application Japan, Jun. 9, 1983, 58-88870[U]
Int. Cl.[4] A47K *10/42;* B65H *1/04*
U.S. Cl. 221—58 3 Claims



1. A tissue paper box comprising:
a plurality of side walls, a bottom wall and a top wall which define an enclosure for containing tissue papers;
said top wall being cut-away to define a paper outlet through which said tissue papers can be removed;
said side walls being collapsible to provide said tissue paper box in compact form after at least some of said tissue papers are removed therefrom;
at least one elastic strip provided in said box and secured to interior surfaces of at least one wall of said box for biasing said tissue papers toward said paper outlet, said at least one elastic strip being at least partly removable through said paper outlet when all of said tissue papers are re-

moved from said box, to be wrapped around said box so as to maintain said box in said collapsed, compact form.

4,616,768

DISCHARGE BARRIER FOR COLLAPSIBLE TUBES

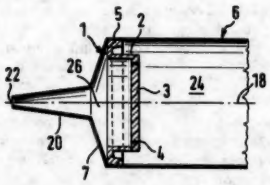
Gustav Flier, Rottenburg, Fed. Rep. of Germany, assignor to Lingner & Fischer GmbH, Bühl (Baden), Fed. Rep. of Germany

Filed Jun. 1, 1984, Ser. No. 616,048

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1983, 3320482; Jul. 14, 1983, 3327852; Jul. 27, 1983, 3327853; Jan. 25, 1984, 3402478

Int. Cl.[4] B65D *35/14*

U.S. Cl. 222—92 49 Claims



45. A valve member for insertion into a container having a flexible tubular wall and having a discharge opening to emit material stored in the container when the tubular wall is squeezed, the container additionally having a shoulder region adjacent the discharge opening, said member comprising:

a unitary plastic dividing element which includes

an annular holding flange having first and second ends and an outer surface between the first and seconds ends, the first end of the holding flange being disposed adjacent the shoulder region and the outer surface of the holding flange being pressed against the tubular wall of the container when the valve member is inserted into the container,

a tubular mounting portion having first and second ends, the mounting portion being disposed within the holding flange with the first end of the mounting portion being oriented toward the first end of the holding flange and with the second end of the mounting portion being oriented toward the second end of the holding flange,

first means, sealingly connecting the first ends of the mounting portion and holding flange, for mounting the mounting portion at a position spaced apart from the holding flange, there being an annular recess between the mounting portion and the holding flange,

a flexible partition having a periphery and at least one slit adjacent the periphery, and

second means for sealingly connecting the periphery of the partition to the second end of the mounting portion.

4,616,769

DOLL HAIR MAKER AND METHOD OF USE

Thomas F. Steigler, and Pamela S. Steigler, both of 800 Johnson St., Coos Bay, Oreg. 97420

Filed Aug. 27, 1984, Ser. No. 644,462

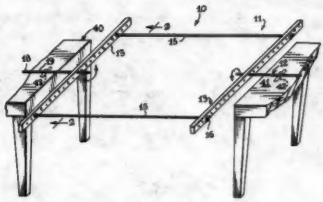
Int. Cl.[4] A41H *43/00*

U.S. Cl. 223—46 4 Claims

1. An apparatus used in combination with at least one elongated length of yarn, a sewing machine and a plurality of elevated generally horizontal independent support surfaces for the purpose of creating hair pieces for cloth dolls wherein the apparatus comprises:

an adjustable framework unit comprising: a plurality of elongated generally rectangular apertured framework members having a plurality of aligned apertures disposed along their length, and at least one centrally disposed aperture intermediate said plurality of aligned apertures; a plurality of elongated rod elements adapted to be received within the apertured framework members and be secured thereto via securing means;

a relatively rotatable support unit operatively connected to the apertured framework members and adapted to suspend and rotatably support the adjustable framework unit



on the generally horizontal independent support surfaces; and,

means associated with said support unit to constrain the relative rotational movement of the support unit with respect to the generally horizontal independent support surfaces.

4,616,770

QUILTING TOOL

Thelma D. Johns, 514 Fairway Dr., Kerrville, Tex. 78028

Filed Oct. 10, 1985, Ser. No. 786,060

Int. Cl.[4] D05B *91/04*

U.S. Cl. 223—101 5 Claims

1. A quilting tool comprising a rod-like handle grippable by at least three fingers of the user, a spoon shaped tool portion rigidly secured to one end of said handle, said tool portion defining a concave surface snugly engagable by the thumb or index finger of the user, whereby said tool portion may be firmly held in a generally vertical position beneath a laminated assembly of cloths to be sewn, said spoon shaped portion having a generally horizontal top end portion having a horizontal length less than 0.375 inches engagable with the cloth laminations and shaped to form an upstanding, limited length, narrow ridge in the quilting cloth laminations, thereby facilitating the passage of a threaded needle through said ridge.

4,616,771

MODULAR LUGGAGE RACK WITH ACCESSORIES

Robert C. Heideman, Studio City, Calif., assignor to AMCO Manufacturing Corporation, N. Hollywood, Calif.

Division of Ser. No. 88,864, Oct. 29, 1979, Pat. No. 4,358,037. This application Nov. 5, 1982, Ser. No. 439,430

The portion of the term of this patent subsequent to Nov. 9, 1999, has been disclaimed.

Int. Cl.[4] B60R *9/00*

U.S. Cl. 224—321 2 Claims

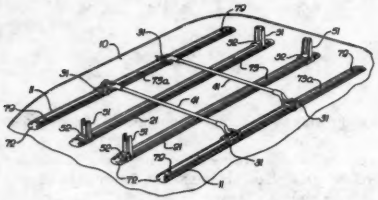
1. A slidable, lockable bracket for use in a vehicle-mounted

luggage carrier having a plurality of slats, each with external tracks formed along opposite edges thereof, said bracket comprising:

a housing adapted to span the width of such a slat and slidably engage such external tracks;

an intermediate clamping member retained by the housing but movable with respect thereto, and wherein the clamping member is positioned between the housing and at least one such track and is adapted to fit slidably along such at least one track when the housing is engaged with such tracks;

means for applying force between the housing and the clamping member, the force-applying means comprising a



screw threaded through the housing, manipulable from outside the housing and engaging the clamping member inside the housing, whereby when the housing is engaged with such tracks the clamping member may be forced against such at least one track;

the aforesaid bracket in combination with means for use in restraining such luggage and in combination with at least one such slat, the slat having external tracks formed along its opposite edges and a trim strip secured along its center and extending upwards above the tracks; and

wherein the central portion of the clamping member is contoured upward to clear the trim strip while remaining in contact with at least one track.

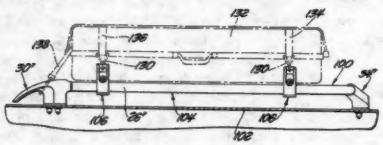
4,616,772

CARRIER RACK AND STANCHION

Ray G. Mareydt, 1800 W. Maple Rd., Troy, Mich. 48084

Continuation of Ser. No. 462,332, Jan. 31, 1983, abandoned. This application Nov. 29, 1984, Ser. No. 676,112

Int. Cl.[4] B60R *9/04*

U.S. Cl. 224—326 **1 Claim**

1. A carrier rack of the type adapted to be mounted upon an exterior surface of the trunk portion of a vehicle, said rack including a load restraining rail supported by stanchion means above the vehicle trunk surface and fastening means adapted to secure said stanchion means to said surface, the improvement comprising:

a. said rail being of a U-shape configuration with its closed end portion extending transversely of the rearward end of the trunk surface and a pair of transversely spaced leg portions projecting forwardly from the closed end portion and respectively terminating toward the forward end of said trunk surface,

b. a first pair of stanchion members adapted to support respectively the forward ends of the rail leg portions, each stanchion comprising:

(1) a pedestal having a base adapted to be supported upon the trunk surface,

(2) fastening means coacting with said pedestal and adapted to engage with the trunk surface to fasten each stanchion thereto,

(3) a first integral portion projecting rearwardly from the upper end of said pedestal and telescopingly supporting the forward end of one rail leg portion above said trunk surface,

(4) a second integral tie-down portion longitudinally aligned with said first integral portion and projecting forwardly and downwardly from the upper end of said pedestal, said second integral portion having an unsupported end spaced forwardly of the pedestal and terminating proximate said trunk surface in a spaced relationship thereto whereby said second integral portion and said pedestal coact to define a cargo tie-down opening, said second integral portion has a curved shape extending downwardly from the upper end of the pedestal, said pedestal including an outwardly opening recessed portion and said fastening means disposed within said recessed portion, and a flexible cover member adhered to said pedestal so as to enclose said recessed portion and said fastening means, and wherein said flexible cover member being flush with the upper end of said pedestal, and

c. a second pair of stanchion members supporting the closed end portion of said tubular rail above the trunk surface, and

d. rail mounting devices for securing at least one cross rail member between said spaced leg portions, each rail mounting device including first and second coacting elements, said first coacting element including a portion projecting within an open end of said cross rail member, said second coacting element secured to said first coacting element for clamping engaging a rail leg portion therebetween, and said second coacting element including an upper portion which is spaced vertically above said cross rail member and having an opening therethrough for receiving one end of a tie-down member.

4,616,773

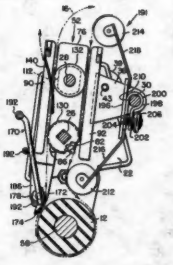
FORMS FEEDING APPARATUS

Leo J. Kerivan, Somerset, Mass., assignor to Precision Handling Devices Inc., Fall River, Mass.

Filed Apr. 27, 1984, Ser. No. 604,761

Int. Cl.[4] B65H *17/38, 35/10*

U.S. Cl. 225—99 **73 Claims**



1. Continuous forms feeding apparatus for use with a platen which comprises tractors engagable with feed perforations along margins of the forms which are partially severed by side perforations, successive ones of the forms being defined by cross perforations which also partially sever the forms and enable them to be stacked in fan folded configuration, means connecting said tractors and platen in conjointly driven relationship for feeding said forms around said platen and through said tractors, means for bursting said side perforations, said

bursting means being defined by flexural members and portions of said tractors, said flexural members being disposed in the path of said forms to oscillate in response to energy derived from said forms and repetitively burst said side perforations, means for enabling the bursting of said cross perforations operative for clamping said forms against said platen upstream of said cross perforations between said platen and said tractors and including a bar having a longitudinal edge engageable with said platen and pivotally mounted to define a toggle with said platen to increase the clamping force of said bar edge against said platen when said bar engages said form against said platen and when said form is pulled in said downstream direction to burst said cross perforations, means disposed upstream of said platen between said platen and said tractors yieldably biasing the surface of said forms opposite to the surface which bears against said platen into an arc sufficient to compensate the relative displacement of said forms linearly fed by said tractors and rotationally fed by said platen, flexurally supported means disposed upstream of said tractors on the opposite side of said tractors from said compensating means for inverting tents at the cross perforations in said forms, and means for bowing said forms to increase the stiffness thereof in the region thereof driven by said tractors and burst by said means for bursting said side perforations.

4,616,774

STAPLER

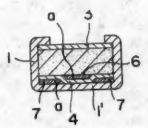
Yasuo Yasuda, Tokyo, Japan, assignor to Plus Corporation, Tokyo, Japan

Filed Feb. 27, 1985, Ser. No. 706,000

Claims priority, application Japan, Mar. 1, 1984, 59-29549[U]; Aug. 1, 1984, 59-118713[U]

Int. Cl.⁴ B25C *5/02*

U.S. Cl. 227—113 **1 Claim**



1. A stapler comprising a base frame, a stapler magazine and handle frame which are coupled together for pivotal motion, wherein a magnet attracting a bar of staples is fixed at the front end of the magazine, the magnet being interposed and securely held between an upper yoke and a lower yoke, said lower yoke being bent into a substantially wave-shape in cross-section and an adhesive agent being applied in gaps between the magnet and the lower yoke and between the lower yoke and the staple magazine.

4,616,775

TRANSLATABLE SOLDERING MACHINE

Jean-Pierre Simonetti, Gif-sur-Yvette, France, assignor to Outillages Scientifiques et de Laboratoires O.S.L. S.A., Carros, France

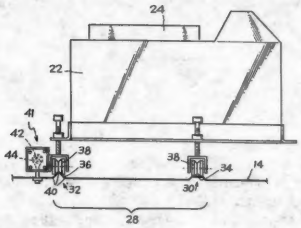
Filed Nov. 14, 1985, Ser. No. 798,170

Claims priority, application France, Nov. 15, 1984, 84 17451

Int. Cl.⁴ B23K *3/00, 3/06*

U.S. Cl. 228—37 **17 Claims**

1. Wave soldering apparatus of the type comprising a frame, at least one solder pot mounted on said frame and equipped with a nozzle designed to produce a wave of solder, a conveyor mounted on said frame and adapted to carry printed circuit boards along a substantially linear path into operative relationship with said wave of solder for soldering, and means for adjusting the height of said solder pot with respect to said path, thus permitting adjustment of the height of the nozzle with respect to said path, wherein said frame comprises an elongated track extending in a direction similar to that of the conveyor and on which is mounted the solder pot, said path and track converging toward each other at a predetermined



angle of small value, said track being substantially parallel with respect to the horizontal, and further including means for adjusting the position of the solder pot along said elongated track.

4,616,776

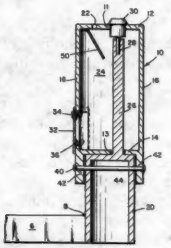
RECEPTACLE ATTACHED TO A PARKING METER FOR COLLECTION OF MONIES ON A MASS LOCATION BASIS AS DONATIONS FOR CHARITABLE PURPOSES

Scott Blumenthal, 6748 Gloria Ave., Van Nuys, Calif. 91432, and George Beacon, 15333 Sherman Way; #V335, Van Nuys, Calif. 91405

Filed Apr. 22, 1985, Ser. No. 725,542

Int. Cl.⁴ E05G *1/00*

U.S. Cl. 232—4 R **7 Claims**



1. A receptacle for collection of money comprising:

a. a substantially cylindrical receptacle having a substantially cylindrical side wall, a top wall attached to the top of said side wall, a bottom wall attached to the bottom of said side wall, and a depending skirt portion of said side wall extending below said bottom wall;

b. a slot in said top wall for receiving donations of money into said receptacle;

c. a lockable hinged wall portion in said side wall near said bottom wall for facilitating removal of money from said receptacle;

d. an opening in said top wall;

e. an opening in said bottom wall vertically aligned with said opening in said top wall;

f. a cylindrical support column having a top wall, an integral vertical upstanding locking column member fixedly attached to said top wall of said support column, said support column being attached to an external means for support, the outside diameter of said support column sized to fit within said depending skirt of said receptacle, said top wall of said support column and the adjacent side wall portion of said support column being received within said depending skirt so that said top wall of said support col-

umn and said bottom wall of said receptacle are in mutual contact and said locking column member of said support column is inserted through said opening of said bottom wall of said receptacle; and

g. means for locking said receptacle to said support column.

4,616,777

AIR-CONDITIONING SYSTEM

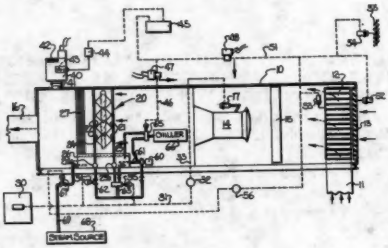
Gary H. Fisher, and H. Pat Padgett, both of Rockingham, N.C., assignors to Industrial Sheet Metal & Mechanical Corporation, Rockingham, N.C.

Continuation of Ser. No. 415,577, Sep. 7, 1982, Pat. No. 4,552,303. This application Aug. 1, 1985, Ser. No. 761,419

The portion of the term of this patent subsequent to Nov. 12, 2002, has been disclaimed.

Int. Cl.[4] B01F *3/02*

U.S. Cl. 236—44 C **7 Claims**



1. An energy efficient air conditioning system for conditioning the air being delivered to an air conditioned area comprising, in combination

a housing having an inlet end for receiving air to be conditioned and a discharge end connected to a supply duct for delivering conditioned air to the conditioned area,

return air damper means associated with said inlet end of the housing for controlling the admission of return air from the air conditioned area to the housing,

outside air damper means associated with said inlet end of the housing for controlling the admission of outside air into the housing,

variable capacity fan means cooperating with said housing for directing air at a desired flow rate through the housing from said inlet end toward said discharge end thereof,

spary means located in the path of air flow through the housing for contacting the air which passes through the housing with a spray of water to cool and condition the air,

mist eliminator means extending across the path of air flow between said spray means and the discharge end of said housing for removing excess water mist from the airstream,

dew point sensing means for sensing the dew point of the conditioned air which is delivered to the conditioned area,

control means associated with said dew point sensing means for controlling the operation of said return air damper means and said outside air damper means,

temperature sensing means for sensing the dry bulb temperature of the air in the conditioned area, and

control means associated with said temperature sensing means for modulating the capacity of said variable capacity fan means and also regulating the quantity of water which is directed into contact with the air by said spray means.

4,616,778

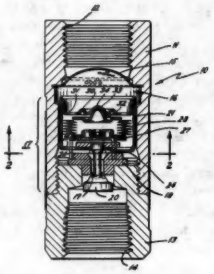
THERMOSTATIC STEAM TRAP

Horst R. Thieme, Harleysville, Pa., assignor to YWHC, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 632,508, Jul. 19, 1984, abandoned. This application Sep. 6, 1985, Ser. No. 773,449

Int. Cl.[4] F16T *1/02*

U.S. Cl. 236—58 **3 Claims**



1. A thermostatic steam trap comprising:

a body member; and

an insert assembly;

said body member having an inlet passage at one end thereof, an outlet passage at the other end thereof and means forming a control chamber intermediate the inlet and outlet passages;

said insert assembly positioned with the control chamber and including an annular member having a central opening forming a valve seat facing toward the outlet passage, a cage freely movable within the control chamber, a valve member fixed to the cage and adapted to be pulled toward the valve seat upon movement of the cage in a direction away from said annular member, said valve member having a head adapted to operate in conjunction with the walls of the outlet passage to cause rapid movement of the valve member away from the valve seat upon displacement of said valve member from said valve seat, expandable and contractable thermostatic means within said cage, means extending through said cage in engagement with said thermostatic means and said annular member whereby expansion of said thermostatic means will move said cage in a direction away from said annular member, and centering means to center said cage and valve member with respect to said valve seat when said thermostatic means is fully expanded;

said inlet passage, outlet passage and control chamber are longitudinally aligned along a common longitudinal axis, and said annular member forming said valve seat is coaxial with said longitudinal axis and adjacent said outlet passage;

said valve member includes a stem portion extending through said seat opening and secured to said cage;

said thermostatic means is a temperature-responsive bellows containing a fluid having a temperature of vaporization less than the temperature of vaporization of water and is expandable and contractable with temperature changes in a direction toward and away from said valve seat;

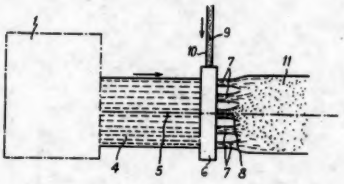
said cage is of generally cylindrical shape, having a first end adjacent said annular member and a second end facing in the opposite direction, said first end having a series of equally spaced protuberances adapted to engage said annular member to limit movement of said cage within said control chamber in a direction toward said annular member.

4,616,779

PROCESS AND DEVICE FOR INJECTING A FINELY DIVIDED MATERIAL INTO A HOT GASEOUS FLOW AND APPARATUS FOR CARRYING OUT THIS PROCESS

Jean-Pierre Serrano, St. Aubin-de-Medoc, and Jean Feuillerat, Bordeaux, both of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Jul. 18, 1984, Ser. No. 632,060
Claims priority, application France, Aug. 8, 1983, 83 13039
Int. Cl.[4] B05B *1/24*
U.S. Cl. 239—79 10 Claims



5. Device for injecting at least one stream of a finely divided material into a hot gaseous flow, comprising:

(a) a thick plate pierced with a plurality of traversing jets and capable of being transversely interposed on the path of said hot gaseous flow, in order to fractionate said hot gaseous flow into a plurality of elementary flows which are at least approximately parallel to each other; and

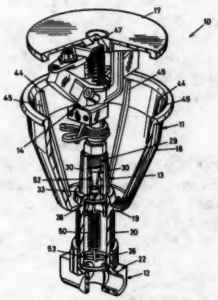
(b) at least one channel made in the thickness of said plate and connecting a supply means arranged at a periphery of said plate to at least one jet supported by said plate and surrounded at least partially by said traversing jet, said supply means being adapted to be fed with finely divided material and the axis of said jet being at least approximately parallel to said elementary flows.

4,616,780

POP-UP SPRINKLER

Eion A. Abbott, 7 Mais Street, Brompton, Australia

Filed May 23, 1984, Ser. No. 613,505
Claims priority, application Australia, May 24, 1983, PF9510
Int. Cl.[4] B05B *15/02, 15/10*
U.S. Cl. 239—113 8 Claims



1. An improved pop-up sprinkler of the type comprising:

a housing having walls defining a sprinkler head housing cavity and a tubular stem depending from said cavity the lower end of said stem being adapted for connection to an underground water supply pipe,

a sprinkler head support means for supporting a sprinkler head on top thereof, said support means being movable between a retracted out-of-use position and an extended in-use water sprinkling position in response to the removal and establishment of water pressure respectively,

characterized by an open ended riser tube constituting said support means, slidably located for vertical up and down movement within said tubular stem, there being a water flushing flow path which fluidly interconnects the stem and said cavity and wherein water flows across the outer surface of said riser tube and the inner surface of said stem, there being cooperable sealing means and sealing engagement means between said riser tube and said tubular stem, arranged to seal off said water flushing flow path when said riser tube is in its extended in-use water sprinkling position, but permitting water flow along said water flow path during said up or down movement of said riser tube the water flow along said first water flushing flow path being effective to flush the surfaces of said riser tube and said stem which are in sliding contact and the space between said stem and said riser tube, and further characterized by a spring assembly operatively connected between said riser tube and said stem for returning said tube to its retracted out-of-use position when the water pressure is removed, said spring assembly comprising a tension spring which, when the tube is in its out-of-use position, is housed interiorly of the riser tube, upper spring end retention means within the riser tube intermediate its ends for releasably retaining the upper end of the spring, and lower spring end retention means adjacent the lower end of said stem and secured with respect thereto for releasably retaining the lower end of said spring, said tension spring terminating at its upper and lower ends in hook formations, said upper spring end retention means comprising spring clip means removably insertable within said riser tube and having a loop portion at its lower end to which is releasably hooked said upper hook formation of the tension spring, said riser tube having respective inwardly projecting shoulders formed interiorly of the riser tube, said spring clip means having out-turned leg portions for abutting engagement with said inwardly projecting shoulders and wherein said lower spring end retention means comprises a transverse retention pin having a length greater than the outside diameter of the riser tube, the inner surface of the stem having diametrically opposed recesses at its lower end and the retention pin having projecting ends for engagement in the opposed recesses of the stem.

4,616,781

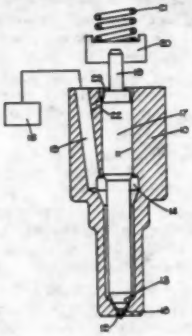
FUEL INJECTION NOZZLES

David J. Gaskell, Sudbury, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed May 4, 1984, Ser. No. 607,240
Claims priority, application United Kingdom, May 19, 1983, 8313904
Int. Cl.[4] F02M *55/00*
U.S. Cl. 239—124 1 Claim

1. A fuel injection nozzle for supplying fuel to a compression ignition internal combustion engine and of the kind comprising a nozzle body, a bore defined in the body, an outlet at one end of the bore, a seating defined in the bore adjacent said outlet, a valve member slidable in said bore, said valve member being shaped for co-operation with said seating, resilient means biasing the valve member into contact with the seating, a fuel supply passage in the body, said passage communicating with said bore, and the valve member defining a surface against which in use, fuel under pressure in said passage can act to lift the valve member from the seating thereby to allow fuel flow from the supply passage through said outlet, characterized by a variable area restrictor in a flow passage extending from said supply passage to a drain, said variable area restrictor being constituted by a port in said flow passage opening into said bore and the valve member, said port being progressively covered by said valve member as the valve member is lifted

from its seating, whereby the degree of restriction offered by said restrictor is dependent upon the axial position of the valve



member in the bore and the flow area of the restrictor decreases as the valve member moves away from the seating.

4,616,782

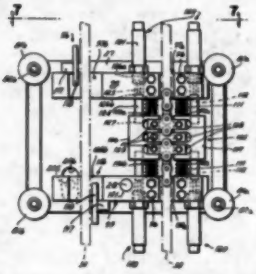
SPRAY GUN CARRIAGE ASSEMBLY HAVING INERTIAL DAMPING AND A VARIABLE STROKE

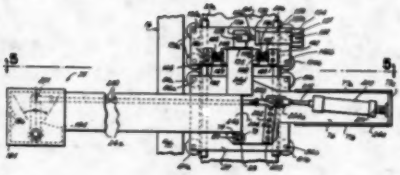
Charles F. Marietta, Norwalk, and Kenneth Holley, South Amherst, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Jan. 22, 1985, Ser. No. 693,676

Int. Cl.⁴ B05B *3/18, 3/00;* **B25J** *17/00;* **F16H** *27/02*

U.S. Cl. 239—752 **24 Claims**





1. A spray gun carriage assembly comprising:

a base;

a spray gun mount adapted to support at least one spray gun operable to spray a coating upon a workpiece;

reciprocating means connected to said base for reciprocating said spray gun mount along a vertical axis, said reciprocating means accelerating and decelerating said spray gun mount to produce a rotational and a linear inertial force while moving along said vertical axis;

damping means carried by said reciprocating means for damping said rotational and linear inertial forces.

4,616,783

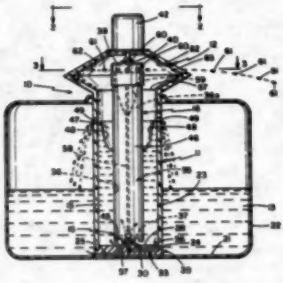
CONSTANT FLOW ROTARY SPRAYING DEVICE

James R. Weber, R.R. 1, Box 268, Lacon, Ill. 61540, and John R. Weber, 15905 N. Brougham Dr., Galena Knolls, Chillicothe, Ill. 61523

Filed Aug. 13, 1984, Ser. No. 640,512

Int. Cl.⁴ B05B *1/28, 3/08*

U.S. Cl. 239—216 **15 Claims**



1. A spraying device for spraying droplets of liquid from a liquid supply comprising a two stage pump system, and a spray control chamber, said two stage pump system having a manifold with a first stage inlet passage system and a second stage outlet passage system, said first stage of said pump system having a reservoir and a first stage pump interconnecting said liquid supply with said reservoir by said manifold first stage inlet passage system for directing and controlling the flow of liquid drawn therethrough by said first stage pump from said supply and into said reservoir, said reservoir having a liquid level control means for maintaining a predetermined level of liquid therein to provide a predetermined static liquid pressure in said reservoir, said second stage of said pump system having a second stage pump interconnecting said reservoir with said chamber by said manifold second stage outlet passage system for directing and controlling the flow of liquid drawn therethrough by said second stage pump from said pump reservoir supply and rotatably impelling said liquid in droplets away from said second stage pump within said spray control chamber and against the walls thereof, said spray control chamber having a discharge opening in the path of said impelled spray droplets for allowing a predetermined quantity and pattern flow of said impelled liquid from said chamber as a droplet spray.

4,616,784

SLURRY ATOMIZER

Harold C. Simmons, Richmond Hts., and Curtis F. Harding, Parma, both of Ohio, assignors to Parker Hannifin Corporation, Cleveland, Ohio

Filed Nov. 20, 1984, Ser. No. 673,294

Int. Cl.⁴ B05B *7/10*

U.S. Cl. 239—404 **11 Claims**

1. A slurry atomizer comprising:

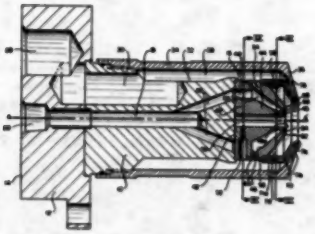
a body having an input end and a discharge end, said body including at least one passageway in communication with the input end and forming an opening at the discharge end;

a casing that covers at least the discharge end of said body and cooperates with said body to define a fluid annulus therebetween, said fluid annulus having a fluid inlet;

a forming element located at the discharge end of said body and having an input face at one end and a generally axially extending projection at the opposite end, said forming

element also including slurry passageways that communicate with the passageway of said body, and further including at internal bore and at least one passageway that opens to the internal bore and is in communication with the fluid annulus;

a conical member having an apical end, a base end, an inner conical surface and an outer conical surface, said base end being located adjacent said forming element and said inner conical surface cooperating with the projection of said forming element to define a conically shaped chamber



having an annulus between the projection and apical end of said conical member and with the slurry passageways of said forming element opening to the conically shaped chamber; and

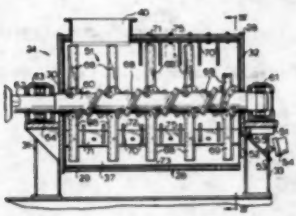
means for swirling fluid, said swirling means being located between the casing and the base end of said conical member, said swirling means having a discharge orifice and cooperating with the outer conical surface of said conical member to define a swirl chamber therebetween, said swirling means further having a flow path between the fluid annulus and the swirl chamber.

4,616,785

METHOD OF AND APPARATUS FOR DEBARKING WOOD CHIPS

Adrian Artiano, Oregon City, Oreg., assignor to Beloit Corporation, Beloit, Wis.

Filed Jul. 30, 1982, Ser. No. 403,487
Int. Cl.⁴ B02C *19/12*
U.S. Cl. 241—26 **21 Claims**



1. A method of debarking wood chips in a container containing no free elements, comprising:

axially compacting a mass of bark carrying wood chips in said container so as to force said mass toward one end of said container;

agitating the compacted mass in said container and causing the chips to rub against one another in the compacted mass;

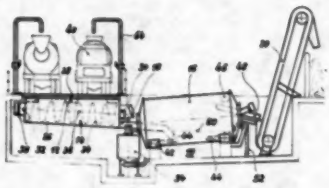
and thereby removing the bark from the chips by rubbing friction of chip against chip as agitated in the compacted mass and without crushing or otherwise damaging the chips.

4,616,786

PLANT FOR PROCESSING SURPLUS CONCRETE

Rudolf Riker, Memmingen, Fed. Rep. of Germany, assignor to Stetter GmbH, Memmingen, Fed. Rep. of Germany

Filed Aug. 13, 1984, Ser. No. 639,698
Int. Cl.⁴ B02C *25/00*
U.S. Cl. 241—35 **13 Claims**



1. In a plant for processing surplus concrete comprising a receiving bin having mutually opposite end walls, two side walls, a bottom and a top covering grate, a cleansing apparatus adapted to supply rinsing water into the receiving bin, also comprising a washing apparatus for separating the surplus concrete into a plurality of components, such as sand and gravel, on the one hand, and very fine components, on the other hand, which latter are entrained by rinsing water discharged at one end of the washing apparatus whereas the first component is discharged at the opposite end of the washing apparatus, also comprising an inclined transfer duct, which adjoins the inclined bottom of the receiving bin and connects the receiving bin to the washing apparatus, and discharge control apparatus for controlling the discharge of surplus concrete from the receiving bin in dependence on the free processing capacity of the washing apparatus, the improvement comprising: the receiving bin consists of an elongate trough, the length of which is at least twice its width and which has a bottom in the shape of a segment of a cylindrical surface, the trough contains a conveyor screw, whereby the concrete in the trough is revolved and setting thereof prevented, which at least in part constitutes the discharge control apparatus and which conveyor screw is rotatably mounted in the end walls of the receiving bin and outside the receiving bin is operatively connected to a drive motor, the axis of rotation of the conveyor screw coincides at least approximately with the geometrical axis of the bottom having the shape of a segment of a cylindrical surface, and the speed of the drive motor for the conveyor screw is adapted to be controlled in dependence on the instantaneous current consumption of a second drive motor for an implement which succeeds the conveyor, said implement being selected from the group consisting of the washing apparatus, an elevator which succeeds the washing apparatus and a belt conveyor for discharged concrete components.

4,616,787

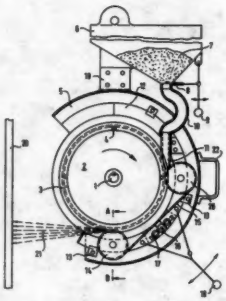
PORTABLE PROJECTION APPARATUS

Walter Kirsten, Weinheim, Fed. Rep. of Germany, assignor to BKW Handels-und Vertriebsgesellschaft, Weinheim, Fed. Rep. of Germany

PCT No. PCT/DE83/00148, § 371 Date Apr. 16, 1984, § 102(e) Date Apr. 16, 1984, PCT Pub. No. WO84/00917, PCT Pub. Date Mar. 15, 1984
PCT Filed Aug. 26, 1983, Ser. No. 605,028
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1982, 3231787
Int. Cl.⁴ B02C *19/00*
U.S. Cl. 241—275 **19 Claims**

1. Portable projection apparatus comprising a housing, a disk member rotatably mounted on said housing about a central axis, an outer band member mounted on said disk member, said outer band member having a plurality of spaced outer band grooves for receiving projecting material, said band grooves

being parallel to one another and extending endlessly circumferentially around the outer peripheral surface of said outer band member, a belt means partially in contact with a circumferential area of said outer band member, said belt means comprising an endless belt and rollers over which said endless belt is disposed, said belt means further comprising ring means disposed radially outwardly of said outer band member and



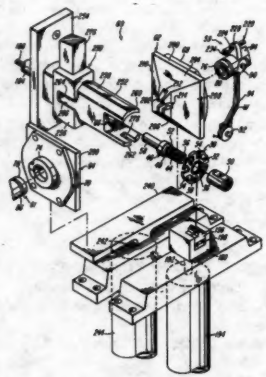
rotatably movable on said housing, said rollers being mounted on said rings means, and operable means operably connected to said ring means for rotating and displacing said ring means about said central axis such that said rollers are displaced together with said ring means so that the entire circumferential area of said endless belt which contacts said drum member is circumferentially displaced about said central axis.

4,616,788

METHOD AND APPARATUS FOR WINDING DYNAMOELECTRIC DEVICES

Hyman B. Finegold, Dayton, Ohio, assignor to The Globe Tool & Engineering Co., Dayton, Ohio

Filed Feb. 5, 1985, Ser. No. 698,246
Int. Cl.[4] H02K *15/09*
U.S. Cl. 242—7.03 **16 Claims**



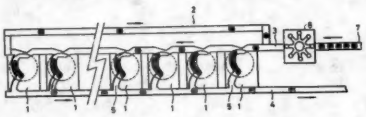
10. In an armature winding machine of the type having a flier, a spindle on which the flier is mounted, means for rotatably driving said spindle about a predetermined axis to cause coils of wire to be wound into spaced coil-receiving slots of cores of dynamoelectric devices, and a winding form for guiding wire wound by said flier into said slots, the improvement wherein said winding form has a first pair of wire guiding surface portions having edges adapted to be substantially aligned with the outward openings of a pair of said slots to guide wire into said pair of slots and a second pair of wire guiding surface portions fixedly spaced from said first pair of wire guiding surface portions and having edges adapted to be aligned with the outward openings of a pair of said slots to guide wire into said last mentioned pair of slots, said second pair of wire guiding surface portions having a configuration different from said first pair of wire guiding surface portions, and means for rotating said winding form about said axis for selectively positioning said first and said second pairs of wire guiding surface portions with their edges substantially aligned with the outward openings of a pair of said slots so that coils having different geometries may be wound.

4,616,789

YARN END READYING DEVICE IN WINDER

Isamu Matsui, Kyoto; Hiroshi Uchida, Oumihachiman; Kazuo Nakanishi, Uji, and Akira Shimano, Kyoto, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Japan

Filed Oct. 12, 1983, Ser. No. 541,096
Claims priority, application Japan, Oct. 13, 1982, 57-180464
Int. Cl.[4] B65H *54/20, 54/22*
U.S. Cl. 242—35.5 R **10 Claims**



1. In a system in which cops having yarn wound around hollow core bobbins are conveyed on carriers, a device for readying a starting end of said yarn for delivery to a winder comprising:

cop hanging means for removing each of said cops from its respective carrier and refitting said cop onto said carrier;

starting yarn end unwinding and cutting means for unwinding said starting yarn end from said cop and cutting said unwound starting yarn end,

tangled yarn cutting means for separating said starting yarn end from said yarn wound on said cop; and

yarn end inserting means for inserting said starting yarn end into the hollow core of said bobbin;

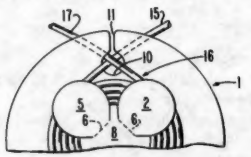
wherein said starting yarn end unwinding and cutting means, said tangled yarn cutting means and said yarn end inserting means are arranged sequentially.

4,616,790

EXCESS TUBING RETAINER FOR A FLUID OR GAS DELIVERY SYSTEM

Delfin J. Beltran, 30 Zapata Way, Portola Valley, Calif. 94025

Filed Jul. 26, 1984, Ser. No. 634,603
Int. Cl.[4] B65H *75/28*
U.S. Cl. 242—85.1 **12 Claims**



1. For use in fluid and gas delivery systems shaving an excess of flexible, hollow tubing between an input end of said tubing coupled to a source of fluids or gases and an output end of said tubing coupled to a receiver of fluids or gases, an excess tubing retaining apparatus comprising:

a disk-shaped member having an outer periphery and means

extending from an interior surface of said disk-shaped member for supporting coils of said excess tubing;

a hole located in said disk-shaped member comprising a predetermined diameter; and

a slot which extends from said hole to said outer periphery of said disk-shaped member, said slot having a width which is less than half said predetermined diameter of said hole for releasably retaining in a substantially nonoccluding manner a first segment of said tubing located between said coils and said input end and a second segment of said tubing located between said coils and said output end such that said first and said second segments cross in the vicinity of said hole at a point located between said coils and said input and said output ends, respectively.

4,616,791

IRRIGATION OR OTHER MACHINE HAVING A ROTATABLE DRUM CARRYING A HOSE OR OTHER FLEXIBLE ELEMENT WOUND THEREON

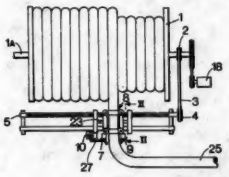
Vernon B. W. Harvey, Tanglewood, Stour Close, Little Canford, Wimborne, Dorset, Great Britain

Filed Feb. 20, 1985, Ser. No. 713,792

Claims priority, application United Kingdom, Mar. 31, 1984, 8408371; Nov. 28, 1984, 8429988

Int. Cl.⁴ B65H *75/40, 75/34*

U.S. Cl. 242—86.2 **9 Claims**



1. An irrigation or other machine which is to be driven or otherwise propellel along the ground including a drum, having a flexible element, such as a hose, wound thereon in a plurality of side-by-side convolutions in at least one layer; a drum-driving motor operable in both the winding on and winding off directions, and a hose-laying device by which a hose-guide through which the hose or other element passes tangentially with respect to an upper part of a convolution of said flexible element is reciprocated parallel to the axis of rotation of the drum as the drum is rotated in either direction, said hose-laying device comprising said hose-guide and a carriage to which said reciprocation is applied, said hose-guide mounted for movement relatively to said carriage for movement in directions parallel to the axis of rotation of the drum between two extreme positions, in one of which said hose-guide is nearer to one end of said carriage and in the other of which said hose-guide is nearer to the other end of said carriage, said hose-laying device also including means responsive to the position of said hose-guide in the length of said carriage to control one of (a) the rotational speed of said drum-driving motor or (b) the ground speed of said machine, whereby to maintain the linear velocity of said flexible element and the ground speed of machine substantially equal to each other, one of said extreme positions of the hose-guide on the carriage corresponding to maximum permitted drum rotational speed and the other of said extreme positions of the hose-guide on the carriage corresponding to minimum drum rotational speed.

4,616,792

CRANK AND BRAKING MECHANISM FOR FISHING REELS

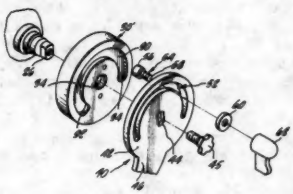
M. Larry Tunks, 16042 Mariner Dr., Huntington Bch., Calif. 92649

Continuation-in-part of Ser. No. 550,757, Nov. 10, 1983, Pat. No. 4,526,331. This application Jun. 13, 1985, Ser. No. 744,334

The portion of the term of this patent subsequent to Jul. 2, 2002, has been disclaimed.

Int. Cl.⁴ A01K *89/00, 89/02*

U.S. Cl. 242—218 **16 Claims**



5. A braking mechanism for retrofitting a fishing reel, the fishing reel comprising a spool, a brake for controlling the amount of drag on fishing line being unwound from the spool, and a shaft for driving the spool and provided with a threaded end portion extending axially outwardly of the spool, the braking mechanism comprising:

(a) a disc-shaped braking wheel for threading onto the end portion of the shaft to rotate therewith, the braking wheel including an outer surface facing away from the spool, the amount the braking wheel is threaded onto the shaft controlling the amount of drag, the braking wheel having a raised portion extending circumferentially around part of the periphery of its outer surface;

(b) a crank mountable on the end portion of the shaft beyond the braking wheel for rotating the shaft and the braking wheel;

(c) a stop extending from the surface of the crank facing the braking wheel, for limiting the amount the braking wheel can be threaded onto the shaft;

(d) means for adjustably mounting the stop on the crank comprising a circumferential slot extending through a disc-shaped portion of the crank, the crank slot being in register with at least a portion of the raised portion of the braking wheel, and wherein the stop is slideable in the crank disc slot.

4,616,793

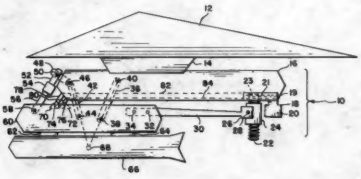
REMOTE PIVOT DECOUPLER PYLON: WING/STORE FLUTTER SUPPRESSOR

John M. Hassler, Jr., Fort Worth, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 10, 1985, Ser. No. 690,274

Int. Cl.⁴ B64C *1/22*

U.S. Cl. 244—137 A **3 Claims**



1. A device for suspending a store from an aircraft support

structure including an airfoil lifting surface subjected to flutter comprising:

store means;

dual link pivot means for suspending said store means from said airfoil lifting surface and for enabling movement of said store means about a remote pivot axis;

spring means connected between said airfoil lifting surface and said store means;

control means actuated by movement of said spring means;

said spring means and said control means maintaining alignment of said store means about a spanwise axis of the lifting surface and isolating the pitch modes of the store means from the torsion modes of the airfoil lifting surface and thereby alleviating airfoil lifting surface flutter and vibratory modes,

an upper pylon section fixed to said airfoil lifting surface,

a movable lower pylon section spaced from said upper pylon section and connected thereto by said dual link pivot means,

damper means connected between said upper pylon and one end of said lower pylon and serving to dampen transient oscillations of said store means,

said dual link pivot means including two spaced angular disposed link members,

one end of each said angular disposed link member being pivotally connected to said upper pylon and the opposite end of each said angular disposed link member being pivotally connected to said lower pylon at substantially the midpoint thereof;

said store means being releasably attached to said lower pylon and adapted to rotate in pitch therewith relative to said upper pylon and about a remote pivot axis located within said store means;

said spring means being a leaf spring and including means rigidly connecting one end of said leaf spring to an end of said lower pylon;

a clevis-type arm secured to the other end of said leaf spring;

an internally threaded sleeve pivotally connected to said clevis-type arm;

a threaded shaft threadingly received through said internally threaded sleeve;

a gear fixed to one end of said threaded shaft;

a gear train meshing with said gear fixed to said threaded shaft and serving to induce rotation of said threaded shaft, whereby

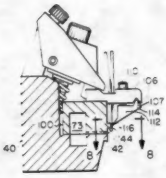
rotation of said threaded shaft causes relative movement of said threaded sleeve to thereby pivot one end of said leaf spring and cause pitching movement of said lower pylon and said attached store means relative to said aircraft structure.

4,616,794

AIR COMB ARRANGEMENT FOR JET DYEING MACHINE

Herbert R. King, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 658,741, Oct. 9, 1984, Pat. No. 4,584,854.
This application Aug. 26, 1985, Ser. No. 769,079
Int. Cl.[4] F16L *3/10*
U.S. Cl. 248—67.5 **3 Claims**



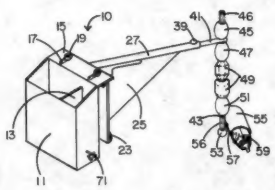
1. An apparatus to secure and align a plurality of tubular members, each located in a groove of a holder comprising: an elongated tube holder, a plurality of openings in said holder with the centerline of some of said openings being displaced out of alignment with the centerline of other openings in said holder, tube members located in and projecting through said openings and adapted to abut a groove in an adjacent member, an elongated triangular shaped member pivotally mounted to said tube holder and having one portion thereof abutting the projecting portions of said tube members and means operably associated with said triangular members to pivot said triangular member in said holder into contact with the projecting portions of the tube members.

4,616,795

NURSING BOTTLE HOLDER

Larry J. Bender, 21 Shar-Denn Dr., Hampton, Iowa 50441

Filed Apr. 12, 1985, Ser. No. 722,510
Int. Cl.[4] A47D *15/00*
U.S. Cl. 248—103 **3 Claims**



1. A nursing bottle holder which is adaptable to a crib or infant seat comprising:

a container for temporary storage of infant feeding accessories;

a crib plate adjustably attached to the container for clamping the nursing bottle holder to the side of the crib;

a support flange affixed to the crib plate;

a bottom flange affixed to the crib plate;

a horizontally extending cylindrical telescoping arm pivotally attached to the support flange;

a webbing affixed to the lower side of the telescoping arm and pivotally attached to the bottom flange;

a swivel lock nut for locking the telescoping arm in a desired direction;

a telescope lock nut for locking the telescoping arm at a desired extension and in the desired rotation;

a cylindrical threaded rod slidably mounted near the outer end of the telescoping arm in a plane perpendicular to the axis of the telescoping arm;

first and second adjusting beads with threaded interiors for locking the threaded rod onto the telescoping arm;

a sleeve slidably and rotatably encasing the threaded rod;

a bottom cap removably attached to the bottom of the threaded rod to prevent the sleeve from sliding off;

a third adjusting bead with a threaded interior for friction locking the sleeve between the bottom cap and the third adjusting bead;

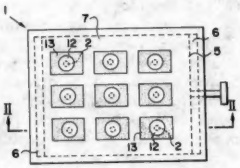
a concave planer arc affixed to the sleeve and approximating the shape of a nursing bottle and with a circumference arcing through at least ninety degrees; and

an elastic strap cooperatively attached to the planer arc for holding the nursing bottle in place.

4,616,796
MAGNETIC RETAINER ASSEMBLY

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Kanagawa, Japan

Filed Apr. 1, 1982, Ser. No. 364,407
Claims priority, application Japan, Jul. 23, 1981, 56-109966; Jul. 23, 1981, 56-109967
Int. Cl.[4] F16B *47/00*
U.S. Cl. 248—206.5 37 Claims



1. A magnetic retainer assembly (1) for selectively securing thereto and detaching therefrom a magnetizable object (14), comprising:

a plurality of columnar permanent magnets (2) of a like shape and size, each of which is axially magnetized and has two opposed magnetic poles at its two axially opposite end faces, the magnets (2) being arranged respectively at predetermined positions regularly spaced apart and constituting a predetermined set in the assembly (1) so as to individually produce magnetic fluxes of a uniform strength emanating from one of said two axially opposite end faces and terminating at the other of said two axially opposite end faces of each of said columnar permanent magnets;

support means (5) having each of said permanent magnets (2) individually at least laterally embedded therein for holding said magnets (2) at said spaced-apart positions in an essentially magnetically insulating relationship with each other;

first magnetic-path forming means (7,12) associated with said support means (5) for magnetically connecting said opposed poles of each of said permanent magnets (2) individually with said magnetizable object (14) through a first magnetic circuit (12, 14, 7, 5) of a sufficiently low magnetic reluctance to cause said assembly (1) to be attached to said object (14) or vice versa; and

second magnetic-path forming means (13) associated with said support means (5) for establishing, for each of said permanent magnets (2) and parallel to the first magnetic circuit thereof, a respective second magnetic circuit (13, 14, 7, 5) of a relatively high magnetic reluctance for shunting said first magnetic circuit when said object (14) is to be, or remains detached from said assembly, said permanent magnets (2) having their areas of magnetization essentially in parallel with one another.

4,616,797
ADJUSTABLE SUPPORT ASSEMBLY

Mina M. Cramer, Montrose, Pa., assignor to Mina Manufacturing, Inc., Enwell, N.Y.

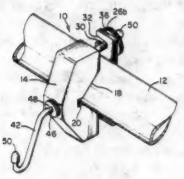
Filed Aug. 13, 1984, Ser. No. 640,192
Int. Cl.[4] A47B *96/06*
U.S. Cl. 248—230 13 Claims

1. An adjustable support assembly adapted for being releasably secured to an elongated support member comprising:

a clamp body member having a first lateral side for engaging the surface of the support member, the width of the body member, at least across the first lateral side, being greater than the width of the support member;

a pair of generally cylindrical pin members, secured to and extending outwardly from the first lateral side of the body member, the pin members being at least partially threaded and being generally parallel and spaced a distance greater than the width of the support member, the length of the pin members extending beyond the body member being greater than the depth of the support member, the body member with the two pin members forming a structure generally U-shaped in cross-section for receiving the support member;

an arm member having a length at least as long as the distance between the two pin members, one end of the arm member including a circular opening extending therethrough proximate the one end, one pin member extending through the opening for attaching the arm member to permit the arm member to pivot about the one pin member generally normal to the axis of the one pin member, the other end of the arm member being adapted for engagement with the other pin member; and



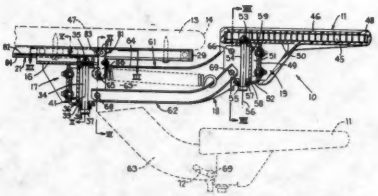
locking means comprised of a nut-like member for engaging the threaded portion of the other pin member for retaining the other end of the arm member into engagement with the other pin member and for urging the arm member into clamping engagement with the support member

whereby the arm member may be pivoted away from the other pin member to permit the support member to be received within the U-shaped structure and then pivoted into engagement with the other pin member to enclose the support member within the support assembly, the locking means being operated to urge the arm member into clamping engagement with the support member to secure the support assembly to the support member.

4,616,798
ADJUSTABLE SUPPORT FOR CRT KEYBOARD

Paul A. Smeenge, Cascade Township, Kent County; Harold R. Wilson, Holland Township, Ottawa County, and Randy P. Nelsen, Wyoming, all of Mich., assignors to Haworth, Inc., Holland, Mich.

Continuation of Ser. No. 386,131, Jun. 7, 1982, abandoned. This application Feb. 26, 1985, Ser. No. 706,231
Int. Cl.[4] A47F *5/00*
U.S. Cl. 248—281.1 38 Claims



1. In combination, a primary support defining thereon an enlarged upwardly facing primary work surface, said primary support defining a front edge adjacent said primary work surface, an auxiliary shelflike support defining thereon an upwardly facing auxiliary work surface for supporting a keyboard unit thereon, and mounting means connecting said primary and auxiliary work supports together for movably sup-

porting said auxiliary support relative to said primary support in the vicinity of said side edge, the improvement wherein said mounting means comprises:

carriage means positioned under and movably mounted on the underside of said primary support for linear horizontal translation of said carriage means relative to said primary support along a direction which extends substantially transverse to said front edge;

first means positioned under said primary support and mounted on said carriage means for pivotal movement relative thereto about a first substantially vertical hinge axis;

second means mounted on the underside of said auxiliary support for pivotal movement relative thereto about a second substantially vertical hinge axis;

vertically swingable, elongated link means having the opposite ends thereof pivotally connected to said first and second means for permitting vertical displacement of the auxiliary support relative to the primary support while maintaining said auxiliary support oriented so that the upper surface thereof retains its predetermined upwardly facing orientation, said link means comprising a vertical parallelogram linkage with elongated upper and lower links having their rearward ends pivotally interconnected to said first means and their forward ends pivotally interconnected to said second means;

spring means associated with said link means for exerting a biasing force tending to swing said link means upwardly to effect raising of said auxiliary support; and

holding means including a manually movable actuator for preventing vertical pivotal displacement of said parallelogram linkage.

4,616,799

AUTOMATIC RECOVERY SWING SIGN STRUCTURE

Hugo E. Rebentisch, Wayne, Mich., assignor to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 603,801, Apr. 25, 1984, abandoned. This application Oct. 9, 1985, Ser. No. 786,164

Int. Cl.[4] F16F 1/14

U.S. Cl. 248—289.3 **8 Claims**

1. A yieldable structure comprising

a yieldable member;

support member for supporting said yieldable member, said yieldable member being substantially parallel to said support member;

pivoting means coacting with said support member and said yieldable member for pivoting said yieldable member pivots, said pivoting means having one pivotal axis about which said yieldable member, said yieldable member pivoting about said pivotal axis, said pivotal axis being substantially parallel to said support member;

positioning means for positioning said yieldable member in a selected position in relationship to said support member;

limiting means for limiting the displacement of said yieldable member from the selected position in relationship to said support member and for maintaining said yieldable member at said selected position under a given force and yielding from said selected position when said force is exceeded, said pivoting means comprising said positioning means and said limiting means; and

torsion means coacting with said support member and said yieldable member for resisting a radial displacement of said yieldable member from said selected position, said torsion means coacting axially through said pivotal axis of said pivoting means providing a center of rotation for said pivoting means, a first portion of said torsion means being substantially parallel to said yieldable means and said support member, said first portion of said torsion means acting like a hinge pin for said pivoting means, and said torsion means resisting an axial displacement of said yieldable member in relation to said support member.

4,616,800

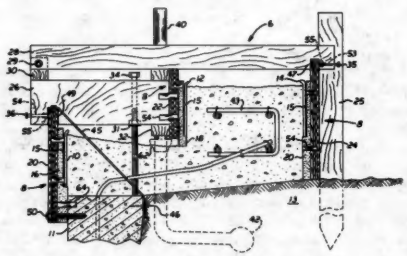
SWIMMING POOL BOND BEAM FORM SYSTEM

Constantine C. Scourtes, and Ralph A. Doerfling, both of 9602 Morris Bridge Rd., Tampa, Fla. 33617

Filed Dec. 17, 1984, Ser. No. 682,418

Int. Cl.[4] E04B 1/16

U.S. Cl. 249—4 **8 Claims**



1. In a swimming pool having concrete sidewalls, a form system for pouring a concrete bond beam, gutter and curb contiguous with said sidewalls and simultaneously bonding tiles to the edges of said bond beam comprising:

(a) a set of elongate form boards having

(i) a first form board attached to said sidewall for defining the waterline edge of said bond beam and gutter,

(ii) a second form board disposed outboard and spaced apart from said first form board for defining an outer edge of said gutter, and

(iii) a third form board disposed outboard and spaced apart from said second form board for defining an outer edge of said curb;

(b) a set of tile holding panels in which

(i) a first of said panels is attached to an outboard face of said first form board,

(ii) a second of said panels is attached to an outboard face of said second form board, and

(iii) a third of said panels is attached to an inboard face of said third form board;

(c) adhesive means disposed on and along the exposed surface of each of said panels for receiving a finished surface of the tiles to thereby temporarily attach the tiles to said panels; and

(d) a plurality of form board support members disposed over and essentially transverse to said set of form boards, said

support members temporarily attached to said first, second, and third form boards for supporting said set of form boards in a first preselected spacing between said first form board and said second form board, and a second preselected spacing between said second form board and said third form board.

4,616,801

APPARATUS TO REGULATE THE FLOW OF LIQUIDS

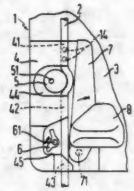
Goeran Cewers, Lund; Jan Johansson, Esloev, and Sven-Gunnar Olsson, Soedra, all of Sweden, assignors to Siemens Elema AB, Solna, Sweden and Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 20, 1984, Ser. No. 572,712

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1983, 3302214

Int. Cl.[4] F16L *55/14;* F16K *51/00*

U.S. Cl. 251—6 18 Claims



1. An apparatus for regulating the flow of liquid through a hose, comprising:

means for guiding the hose comprising at least one guide for supporting and engaging at least a portion of the hose; means for clamping the hose, including a motor-driven eccentric; and a pivotal blocking device forming a separate part of the hose guiding means from the at least one guide, as well as forming a part of the clamping means, the blocking device being pivotal between a closed position, in which position the at least one guide cooperates with the closed blocking device so that the at least portion of hose is safely and completely enclosed between the hose guiding means and the pivotal blocking device, which portion of hose may or may not be clamped shut, and the closed blocking device further cooperates with the motor-driven eccentric for controlling the cross-section of the hose, and an open position in which the hose is released when the pivotal blocking device no longer cooperates with the at least one guide to completely enclose the at least portion of hose.

4,616,802

TUBING OCCLUDER

Charles C. Tseng, Lake Bluff, and Kenneth Lynn, Spring Grove, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 6, 1984, Ser. No. 678,624

Int. Cl.[4] F16L *55/14*

U.S. Cl. 251—7 10 Claims

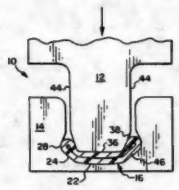
1. A device for releasably occluding a flexible tubing comprising:

a housing adapter to receive said flexible tubing and defining a recessed tubing occluding surface against which a transverse section of the tubing is transversely urged and compressed when in an occluded position;

a wedge-shaped tongue for urging the transverse section of the tubing against said tubing occluding surface;

said tubing occluding surface including a slightly concave mid-portion, said slightly concave mid-portion extending transversely to said tubing when said tubing is received in said housing, said tubing occluding surface further having at each transverse end of said concave mid-portion a sloped, planar surface, each sloped, planar surface forming an angle at the intersection with said concave mid-portion of between about 120° and 150°, a concave side surface defining a pocket in said housing at the end of each sloped, planar surface opposite the end of each sloped, planar surface at said mid-portion;

said tongue defining a tongue surface for urging said transverse section of tubing against said tubing occluding surface and including a planar tongue mid-portion surface generally parallel to and substantially corresponding in width to said slightly concave mid-portion of said tubing occluding surface for urging said transverse section of tubing against said mid-portion of said tubing occluding surface, and tongue surface further including at each



transverse end of said planar tongue mid-portion surface a planar side portion extending from said planar tongue mid-portion and forming an angle with the intersection of said planar tongue mid-portion of between about 225° and 270° for urging transverse ends of the tubing against said sloped planar surfaces and concave side surfaces of said tubing occluding surface;

said housing and tongue being mounted for movement relative to and away from each other in a generally normal direction relative to said tubing occluding mid-portion surface and said planar tongue mid-portion surface for occluding and releasing the transverse section of tubing contained between said tongue and housing.

4,616,803

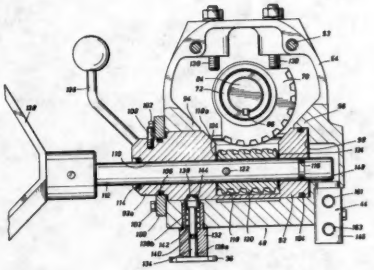
DECLUTCHABLE VALVE OVERRIDE

Petrus J. R. Schils, Breda, Netherlands, assignor to Keystone International, Inc., Houston, Tex.

Filed Aug. 23, 1983, Ser. No. 525,655

Int. Cl.[4] F16K *31/14*

U.S. Cl. 251—14 12 Claims



1. Flow control apparatus comprising:

a main valve assembly having an open position and a closed position and comprising a valve body defining a flowway therethrough and a valve element mounted in said flowway for movement between said open and closed positions;

a fluid operated main valve actuator operatively connected

to said main valve assembly for moving said main valve assembly between said open and closed positions;

actuator control means for communicating a source of pressurized control fluid to said actuator for selectively causing said actuator to place said main valve assembly in said open or closed position;

override means associated with said main valve assembly and selectively shiftable between an engaged mode, in which said override means is operatively connected with said main valve assembly for moving said main valve assembly between said open and closed positions, and a disengaged mode, in which the operative connection between said override means and said main valve assembly is interrupted whereby said main valve assembly may move independently of said override means,

said override means comprising

a first rotary element having an axis and being connected to said valve element,

a second rotary element having an axis and being rotatably connected to said valve body,

clutch means for moving one of said rotary elements laterally with respect to the axis of said one rotary element toward and away from the other of said rotary elements between said engaged mode and said disengaged mode,

and drive means operatively connected to said second rotary element for rotating said second rotary element about an axis of said second rotary element;

and shut-off means functionally interconnected with said override means and fluidly connected to said actuator control means said shut-off means comprising a shut-off valve interconnecting said actuator and said source of control fluid, said shut-off valve having a flow position, associated with said disengaged mode, for communicating said source of control fluid to said actuator, and a shut-off position, associated with said engaged mode, for blocking said source of control fluid to said actuator and simultaneously exhausting said control fluid from said actuator.

4,616,804

GATE VALVE

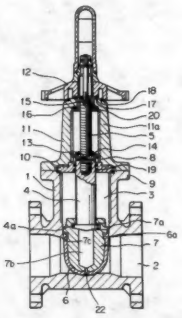
Nichiro Sano, and Hirotoshi Ogawa, both of Nobeoka, Japan, assignors to Asahi Yukizai Kogyo Co., Ltd., Miyazaki, Japan

Filed Jan. 30, 1984, Ser. No. 575,400

Claims priority, application Japan, Sep. 19, 1983, 58-143690[U]

Int. Cl.[4] F16K *31/50, 3/28*

U.S. Cl. 251—267 **2 Claims**



1. A gate valve capable of handling slurries, comprising:

a plastic valve casing having a passage and a valve chamber which extends in a direction perpendicular to a longitudinal axis of said passage, the valve chamber communicating with the said passage and being open at its upper end;

a valve body arranged in said valve chamber such that the up and down movement of the body is effective to open and shut said passage, the valve body being covered with a resilient cover, said resilient cover having an upper portion with an integrally formed, inwardly directed annular projection fitted into an annular groove located at an upper peripheral portion of the valve body, said valve body having a cavity, said valve body and resilient cover having spherical bottom portions with a passage extending through said bottom portions to said cavity, and a spindle engaged with said valve body at a lower end of said spindle and arranged to move up and down in dependence on rotation of a handle coupled with said spindle, whereby handle rotation is effective to move the valve body up and down in said valve chamber;

a plastic hollow cover mounted over the upper end of the valve chamber, the hollow cover being provided with an aperture at an upper end thereof and being formed with vertical lead grooves on an inner wall thereof;

a spindle support member isolating the valve chamber from the interior of the hollow cover;

the spindle comprising a lower first spindle and an upper second spindle, said lower first spindle being constructed from plastic, said upper second spindle being made of metal and having a threaded portion, said first spindle sliding through in a sealed manner through the spindle support member from the valve chamber into the interior of the cover;

a guide ring having projections, said guide ring being attached to an upper end of said first spindle, said projections of said guide ring engaging with said vertical lead grooves of said hollow cover, said first spindle including an axial projection at its upper end, said guide ring fitted onto said axial projection so as to be interlocked against rotation relative to said first spindle, said axial projection provided with a snap ring which engages a transverse groove on an upper region of said axial projection so as to secure said guide ring to said axial projection;

said threaded portion of said second spindle passing through said aperture of said cover.

4,616,805

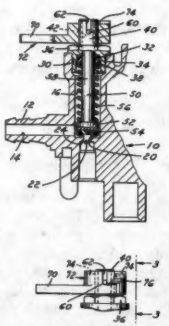
FUEL SHUT-OFF VALVE

Albert L. Haas, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Filed Jun. 3, 1985, Ser. No. 740,575

Int. Cl.[4] F16K *31/528*

U.S. Cl. 251—297 **2 Claims**



1. A fuel shut-off valve to be interposed between a fuel source passage and a fuel utilization device which includes:

(a) a body having a valve bore,

(b) means forming a seat at one end of said bore open on one side to a fuel source passage and at another side to a fuel utilization passage,

(c) a valve element slidable in said bore having a valve head at one end to cooperate in opening and closing said valve seat and an actuator stem extending from said valve head, that improvement which comprises,

(d) a valve stem guide fitting closing the end of side bore opposite said seat, and a stationary turret on said fitting having an axial side slot,

(e) an annular valve stem seal positioned in said bore adjacent said fitting backed by means to retain said seal,

(f) means to bias said valve head to a closing position on said seat and to retain said seal adjacent said fitting comprising a coil spring seated at one end against said means to retain said seal and at the other end against said valve head,

(g) means to actuate said valve to an open position comprising:

(1) an actuating lever,

(2) a collar on and integral with said lever having a ramp surface rising from a point of origin to a point at the top of said collar,

(3) follower means comprising a cross-pin on said valve stem to ride on said ramp whereby turning said collar and lever raises said valve stem and said valve head against the bias of said coil spring to open said valve seat, and

(h) means to restrain said valve element against rotation in said bore comprising an extension on said cross-pin engaged in said side slot of said turret.

4,616,806

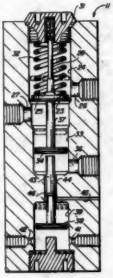
VALVE

Bill G. Davis, Phoenix, Ariz., assignor to Jetco, Inc., Phoenix, Ariz.

Continuation of Ser. No. 534,797, Sep. 22, 1983, abandoned. This application Jul. 3, 1985, Ser. No. 751,474

Int. Cl.[4] F16K *31/12*

U.S. Cl. 251—63.4 **1 Claim**



1. A valve device for controlling the flow of fuel to an internal combustion engine having a pressurized lubricating oil system associated therewith, said valve being adapted to be disposed in the fuel line between a fuel pump and the engine, said device comprising a valve body having a bore with an axis therein, a pair of fuel inlet passages in said body both simultaneously and continuously communicating with said bore and said fuel line, means providing a valve seat between one of said inlet passages and said outlet passage, valve means disposed in said bore and moveable axially therein for cooperation with said valve seat to close communication between said one inlet passage and said outlet passage, a balancing piston disposed in sealing relationship with said bore between the other of said inlet passages and said outlet passage and moveable axially in said bore, means connecting said piston and said valve means for transmitting fuel pressure forces acting on said piston to said valve means, the construction and arrangement being such that when said valve means is out of engagement with said valve seat pressure from fuel entering said bore through said one inlet passage acts on one side of said piston and balances pressure from fuel entering said bore through said other inlet passage and acting on the opposite side of said piston, spring means urging said valve means into engagement with said valve seat, means carried by said valve body and adapted to communicate with and to be moved in response to changes in the pressure in the lubricating oil system of the engine, and mans for transmitting movement of said pressure responsive means to move said valve means away from said valve seat when the pressure responsive means senses a predetermined pressure in said oil system.

4,616,807

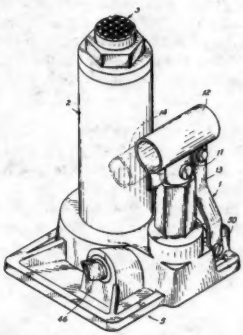
MOLDING JACK BASE

Tsung-Hua Cheng, P.O. Box 10160, Taipei, Taiwan

Filed Apr. 8, 1985, Ser. No. 721,223

Int. Cl.[4] B66F *3/24*

U.S. Cl. 254—93 H **2 Claims**



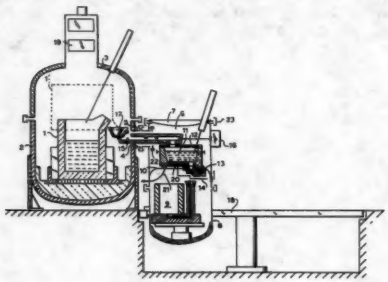
1. A jack base comprisng a preformed plastic base having a socket adapted for the lower portion of a hydraulic cylinder and a hydraulic pump of a jack having a hydraulic oil conduit connected between said pump and said cylinder, said lower portion of said cylinder and said pump connected with said hydraulic oil conduit, which includes an upper tube transversely connected between the jacket of said hydraulic cylinder and the bottom of said hydraulic pump and formed with a check valve therebetween, a lower tube transversely connected between the bottom of said cylinder and the bottom of said pump and formed with a check valve therebetween, and a side pipe vertically connected between said upper tube and said lower tube and formed with a control valve therebetween, being fitted into said socket of said preformed plastic base and a resin binder being further filled into said socket and heated, cured so as to sturdily bind said binder with said preformed base in combination with said lower portion of said cylinder and said pump, and said conduit to form an integrated body.

4,616,808

APPARATUS FOR THE TREATMENT AND CASTING OF METALS AND ALLOYS IN A CLOSED SPACE

Ivan D. Nikolov, deceased, late of Sofia; by Vassilka P. Dimova, heir, Sofia; Dobromir I. Dimov, heir, Sofia; Petar I. Dimovsons, heir, Sofia; Marin I. Marinov, Sofia; Ivan M. Peytchev, Sofia; Tzolo V. Rashev, Sofia, and Iliya G. Tchorbov, Sofia, all of Bulgaria, assignors to Institute po Metaloznanie i Technologia no Metalite, Sofia, Bulgaria

Filed Feb. 4, 1985, Ser. No. 698,086
Int. Cl.[4] C21C 7/10
U.S. Cl. 266—207 2 Claims



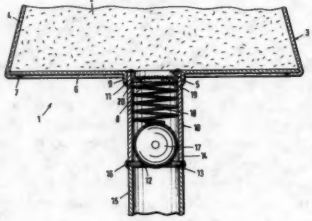
1. In an apparatus for treating and casting metals and alloys, said apparatus including an induction furnace and a hermetic chamber, inside which there is disposed a casting mold, the induction furnace and the hermetic chamber being interconnected by a movable launder, the improvement wherein above one end of the movable launder there is mounted a siphon, and underneath its other end there is disposed a tundish which is mounted inside a first hermetic chamber that is gas-tightly sealed against a separating plate attached to a second hermetic chamber containing the casting mold, the tundish being provided with a bottom for blowing-through with alloying gas.

4,616,809

GAS BUBBLE BRICK FOR METALLURGICAL VESSELS

Hans Höffgen, IM Silbertal 13, 5410 Höhr-Grenzhausen, Fed. Rep. of Germany

Filed Oct. 24, 1984, Ser. No. 664,437
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1983, 3341446
Int. Cl.[4] C21B 7/16
U.S. Cl. 266—220 3 Claims



1. Gas bubble brick for metallurgical vessels consisting of a porous, gas-permeable shaped brick made of refractory material, a gas-tight partial encasing surrounding the latter, which encasing is welded together from a metal jacket extending around the lateral curcumferential area of the shaped brick and a metal cover covering the outer face of the shaped brick, a gas supply pipe which is welded to the rim of a central gas inlet orifice of the metal cover, as well as a break-through safeguard in the area of the gas supply pipe, wherein

a constricted cross-section, defining a valve seat, is provided in the gas supply pipe at a distance from the gas inlet orifice of the metal cover,

a closure body is provided in the pipe section between the metal cover and the constricted cross-section, said body being movable at least in the axial direction of the gas supply pipe, and

a compression spring is provided between the closure body and the metal cover which presses the closure body against the valve seat,

the cross-section of said closure body being smaller than the inside diameter of the gas supply pipe and greater than the constricted cross-section,

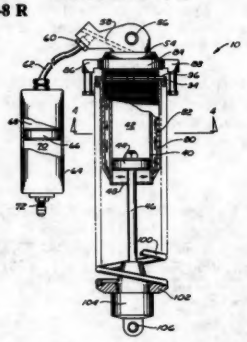
the closure body, together with the constricted cross-section, forming a non-return valve.

4,616,810

LIQUID COOLED SHOCK ABSORBER

Wayne U. Richardson, and Robert H. Richardson, both of 862 N. Pleasant St., Southington, Conn. 06489

Filed Mar. 28, 1985, Ser. No. 716,963
Int. Cl.[4] F16F 9/42
U.S. Cl. 267—8 R 13 Claims



1. A temperature stabilizable shock absorber for a motorcycle or other vehicle comprising:

cylinder means to form a generally fluid tight damping chamber;

damping piston means received by said cylinder means and axially displaceable therein comprising a piston connecting a shaft projecting through an end of said first cylinder means to produce a reciprocating damping displacement of said piston in response to axial forces applied to said shaft;

fluid reservoir means to supply a source to damping fluid for said damping chamber;

shaft mounting means to mount an end of said shaft to a vehicle;

cylinder mounting means to mount said cylinder means to a said vehicle;

jacket means to form a stabilizing chamber at least partially surrounding said damping chamber and extending axially therealong said stabilizing chamber being in fluid isolation relative to said damping chamber and said reservoir means and forming a generally axially extending first passage having an inlet opening and a generally axially extending second passage having an outlet opening in fluid communication therewith, said openings being disposed at the same general axial position of said stabilizing chamber; and

suspension spring means comprising a coil spring surrounding said jacket means for axially biasing said shaft for projection from said cylinder means said spring means having opposite ends, both said ends being axially spaced from said openings in one axial direction of said jacket means;

so that a fluid circulating in said stabilizing chamber between said inlet opening and said outlet opening traverses said first passage in a generally axially extending direction and circulates said second passage in a generally opposing axial direction along a circulation path which is in heat exchange relationship with said damping fluid and said spring.

4,616,811

AIR SUSPENSION

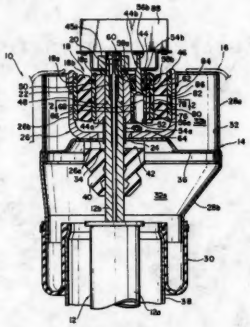
Shuuichi Buma, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Mar. 8, 1985, Ser. No. 709,661

Claims priority, application Japan, Jul. 12, 1984, 59-104457[U]

Int. Cl.⁴ F16F *3/08*

U.S. Cl. 267—35 **10 Claims**



1. An air suspension capable of varying the spring constant by controlling communication between a main air chamber and an auxiliary air chamber provided in association with a shock absorber including a cylinder, a piston and a piston rod, comprising:

a peripheral wall member defining a wall portion of one of said air chambers and having one or a plurality of first air paths penetrating from an inner peripheral surface to an outer peripheral surface to open to said one air chamber;

a tubular elastic member disposed inside said peripheral wall member and having one or a plurality of second air paths penetrating from an inner peripheral surface to an outer peripheral surface of said tubular elastic member to communicate to said first air path;

a valve container disposed inside said tubular elastic member and coupled to said piston rod and having a valve containing section, one or a plurality of third air paths penetrating from said valve containing section to an outer peripheral surface of said valve container, and a fourth air path provided circumferentially on the outer peripheral surface of said valve container and communicating to said second and third air paths respectively; and

a valve body disposed in said valve containing section of said valve container and having a fifth air path communicating to the other one of said two air chambers, and one or a plurality of sixth air paths penetrating from said fifth air path to an outer peripheral surface of said valve body and being able to communicate to said third air path.

4,616,812

HYDROPNEUMATIC SPRING CYLINDER AND METHOD OF FILLING THE SAME

Lino E. Tornero, 629 Joyner St., Greensboro, N.C. 27403

Filed Nov. 13, 1984, Ser. No. 671,292

Int. Cl.⁴ F16F *1/00*

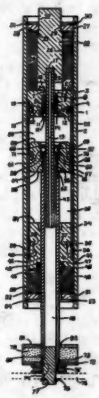
U.S. Cl. 267—131 **6 Claims**

1. A hydropneumatic spring for use as an adjustable columnar support for such apparatuses as chairs, tables, stools, and the like requiring height or angle adjustments, said spring comprising:

(a) a cylindrical casing including plug means for closing said casing adjacent each end and containing a fluid under pressure therein;

(b) a piston movably supported within said cylindrical casing with respect to the inner wall thereof, said piston dividing said casing into an upper chamber and a lower chamber and having an axial passageway therethrough for providing a path for said fluid therebetween;

(c) a hollow piston support rod having one open end thereof



received in the passageway in said piston for defining said fluid path therethrough between said upper and lower chambers, the other end of said support rod extending through one of the closed ends of said casing in sealed, slidable, axially guidable relation thereto and being closed at the bottom end thereof;

(d) valve means for selectively opening and closing the fluid path between said upper and lower chambers by passing said fluid from one of said chambers to the other chamber through said hollow piston support rod responsive to axial forces exerted on said hydropneumatic spring which tend to move said cylinder relative to said piston.

4,616,813

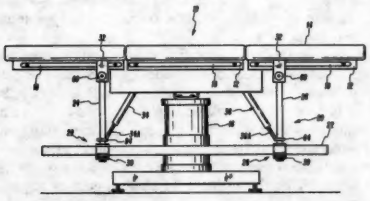
SUSPENSION FOR SURGICAL SUPPORT APPARATUS

Bernard E. McConnell, Rte. 2, Box 87, Greenville, Tex. 75401

Continuation-in-part of Ser. No. 598,579, Apr. 10, 1984, Pat. No. 4,579,324. This application Jan. 22, 1985, Ser. No. 693,146

Int. Cl.⁴ A61G *13/00*

U.S. Cl. 269—328 **12 Claims**



1. A suspension assembly for use in combination with a table comprising, in combination:

a horizontal support bar;

first and second clamps each adapted for releasable attachment to said table;

first and second support legs, each support leg having a first end portion coupled to said support bar and having a second end portion attached to one of said clamps;

said first and second clamps each including a clamp body having an attachment portion adapted for coupling engagement with one of said support legs, a fixed jaw member projecting from said clamp body for engaging a portion of said table, and having a cavity for receiving a compression member;

a compression member received within the cavity in each clamp body and mounted thereon for movement away from said fixed jaw member to an open, retracted position allowing positioning of said fixed jaw member and said compression member about said table portion, and for movement from the retracted position to an extended position for engagement with said table portion;

means coupled to said clamp body for driving said compression member from its open, retracted position toward its extended position and into compressive engagement with said table portion; and,

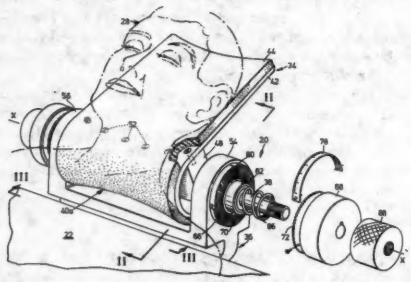
said compression member on each clamp body being mounted for pivotal movement to and from the extended and retracted positions, and said compression member comprising a cam portion for engaging said drive means and a movable jaw portion for engaging said table portion.

4,616,814

X-RAY HEAD HOLDER

Derek C. Harwood-Nash, Willowdale; Charles R. Fitz, Toronto; Edward T. Zouch, Toronto, and John M. Smith, Toronto, all of Canada, assignors to The Hospital for Sick Children, Toronto, Canada

Filed Dec. 7, 1983, Ser. No. 559,137
Int. Cl.[4] A61G *13/00*
U.S. Cl. 269—328 **15 Claims**



1. A device for supporting at least the head of a patient during x-ray examination and the like, the device comprising:

a support capable of carrying the head of an adult patient;

a base adapted to be secured to external structure and defining two upstanding lugs on respectively opposite sides of said support; and,

means coupling the support and base and adapted to permit pivotal movement of the support with respect to the base about an axis which normally extends generally horizontally transversely of and below the neck area of an adult patient whose head is disposed on said support, said coupling means including: a shaft coupled to the support and extending through openings in said lugs in which the shaft can turn as the attitude of the support is adjusted; and means for securing the support in an adjusted position about said axis, comprising: first and second collars adapted to be releasably locked together in any of a series of angularly spaced positions of said shaft, one of said collars being secured to said base and the other collar being keyed to the shaft for longitudinal sliding movement therealong between a first position in which said collars are disengaged, and a second position, in which said collars are releasably locked together;

said support including a lower portion which is intended to underlie the neck area of said patient and which curves generally about the axis defined by said coupling means, and an upper portion which extends generally tangentially outwardly from said lower portion and which is adapted to support the rear head area of an adult patient, said portions defining respective outer surfaces which merge together to present a substantially smooth profile to the patient;

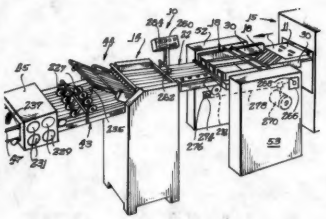
whereby the support can be adjusted to a variety of angular positions about said axis, in any of which said outer surfaces provide substantially continuous support for the head and neck area of the patient.

4,616,815

AUTOMATIC STACKING AND FOLDING APPARATUS

Michael Vijuk, Oakbrook, Ill., assignor to Vijuk Bindery Equipment, Inc., Elmhurst, Ill.

Filed Mar. 5, 1985, Ser. No. 708,300
Int. Cl.[4] B42C *1/00*
U.S. Cl. 270—45 **16 Claims**



1. An apparatus for stacking thin, non-folded, flexible sheets, feeding sheets from the stack and for folding the sheets comprising the combination of:

a conveyor for continuously feeding a stream of shingled sheets at a predetermined speed into a stacking station and for dropping the sheets while still shingled one by one on top of the other to form a stack of sheets at the stacking station,

a front stop in the stacking station abutted by the imcoming sheets to limit their forward travel and to define the forward location of the stack of sheets,

a back jogger means located at the back of the stack for jogging the rearward edges of the incoming sheets and the sheets in the stack toward and against the front stop,

side jogger means for jogging the incoming lateral sides of the sheets to align the sheets with their lateral edges aligned within the stack,

air levitating means for providing a layer of air between sheets in the stacking station for separating the lowermost sheets in the stack by air while the sheets are being jogged,

bottom suction feed means including a continuously rotating suction roller for gripping the leading end of the bottom sheet of the stack while incoming sheets are being stacked on top of the stack in the stacking station,

means defining a gap at the lower front end of the stacking station to allow passage of only the lowermost sheet through the gap,

a continuously operating conveyor means for conveying each sheet from the stacking station to a folding station,

adjustable speed conrol means to adjust the speed of the vacuum cylinder and conveyor means relative to that of said conveyor continuously feeding shingled sheets to said stacking station to prevent an over or under accumulation of sheets in the stacking station, and

folding means at the folding station for folding a continuous stream of sheets being fed from the stack hy the conveyor means.

4,616,816

APPARATUS FOR SUPERPOSING FLEXIBLE FLAT STRUCTURES, ESPECIALLY SHEETS AND SIGNATURES, AND METHOD OF USING SUCH APPARATUS

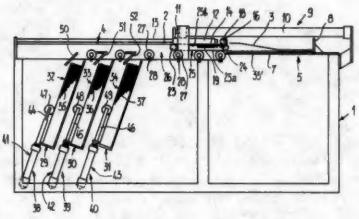
Hans-Ulrich Stauber, Griit, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Sep. 23, 1985, Ser. No. 778,615

Claims priority, application Switzerland, Sep. 24, 1984, 4561/84

Int. Cl.⁴ B65H *39/02*

U.S. Cl. 270—58 **12 Claims**



1. An apparatus for superposing flexible flat structures, especially sheets and signatures, comprising:

at least one receiving bin open toward its top;

said at least one receiving bin accommodating a supply of said flexible flat structures;

deposit means operatively associated with said at least one receiving bin and in which said flexible flat structures are collected in a superposed condition;

a predetermined conveying path leading from said at least one receiving bin to said deposit means;

said at least one receiving bin being arranged below said conveying path;

collecting means displaceable along said predetermined conveying path in order to thereby convey said flexible flat structures to said deposit means after their withdrawal from said at least one receiving bin;

said collecting means containing at least one endless conveyor belt drivable in a predetermined direction of movement;

means for driving said endless conveyor belt;

said conveyor belt defining a first run which faces said at least one receiving bin; and

said first run of said conveyor belt being circulatingly drivable in said predetermined direction of movement of said conveyor belt.

4,616,817

PAPER SHEET DISPENSING APPARATUS

Masahide Yamauchi, Kawasaki, and Minoru Hirose, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 3, 1984, Ser. No. 606,684

Claims priority, application Japan, May 9, 1983, 58-80291

Int. Cl.⁴ B65H *3/44*

U.S. Cl. 271—9 **19 Claims**

1. A paper sheet dispensing apparatus comprising:

storage means for stacking paper sheets along a predetermined stacking direction, said storage means having an outlet port on one edge of one end thereof;

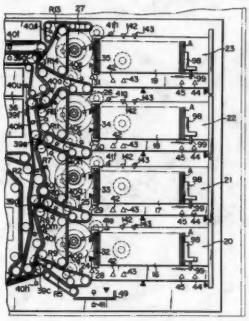
rotating means, rotatably disposed at said outlet port, for engaging one of the paper sheets stacked in said one end of said storage means;

biasing means for biasing the paper sheets toward said rotating means so as to cause said rotating means to be engaged with said one of the paper sheets;

first driving means for rotating said rotating means to convey said one of said paper sheets which is engaged with said rotating means through said outlet port in response to rotation of said rotating means;

first engaging means, movable in the predetermined stacking direction, for freely engaging with a paper sheet whose end is located in a position opposite to said one edge of said storage means;

second driving means for moving said first engaging means



apart from said rotating means in the predetermined stacking direction while said first engaging means continues to be engaged with said one end of the paper sheets; and

third driving means for moving said first engaging means thereby disengaging said first engaging means from said one end of the paper sheet after said first engaging means is moved apart from said rotating means by said second driving means,

wherein the paper sheets disengaged from said first engaging means by said third driving means are engaged with said rotating means due to the biasing force of said biasing means.

4,616,818

CARTON BLANK FEED APPARATUS

Peter Vischer, Golden, Colo., assignor to Adolph Coors Company, Golden, Colo.

Filed Mar. 15, 1985, Ser. No. 714,080

Int. Cl.⁴ B65H *3/32*

U.S. Cl. 271—113 **5 Claims**

1. A carton separating apparatus for separating a carton from a stack of cartons comprising:

a rotatable body means;

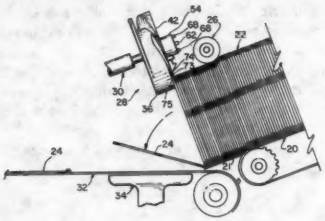
a drive shaft means connected to said rotatable body means;

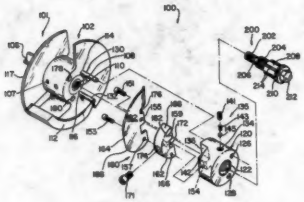
a plate means mounted axially adjacent said body means;

a separating blade means attached to said plate means and having a side surface facing said body means and defining an axial gap therebetween adapted to receive a portion of a carton;

a single screw means supporting and connecting said plate means to said body means and including a first threaded portion of one thread pitch connected to said body means and a second threaded portion of another thread pitch connected to said plate means whereby rotation of said

single screw means causes differential relative axial displacement of said plate means and said separating blade





means whereby the length of said axial gap therebetween is adjustable by rotation of said single screw means.

4,616,819

PAPER SHEET FEEDING ARRANGEMENT

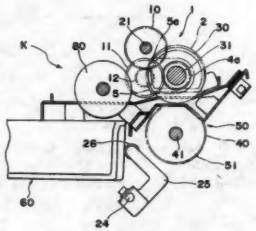
Tatsumi Makio, Toyohashi; Kazumasa Hayakawa, and Genta Sakaguchi, both of Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 1, 1985, Ser. No. 793,951

Claims priority, application Japan, Nov. 8, 1984, 59-169522[U]

Int. Cl.[4] B65H *3/52*

U.S. Cl. 271—122 **8 Claims**



1. A paper sheet feeding arrangement for feeding paper sheets one sheet by one sheet, comprising:

a cassette for accommodating a stack of the paper sheets, which is detachably mounted on a paper feeding section;

a paper feeding roller for feeding the paper sheet in a paper feeding direction from said cassette;

a feed roller for transporting the paper sheet fed by said paper feeding roller;

a paper sheet separating roller in contact with said feed roller and rotatable in a direction counter to the paper feeding direction;

said feed roller and said paper sheet separating roller being provided forwardly of said paper feeding roller in the paper feeding direction;

a return roller which is rotatably provided coaxially with one of said feed roller and said paper sheet separating roller and is formed, at its outer peripheral portion, with a cutoff face such that said cutoff face confronts a feed passage of the paper sheet when the paper sheet is fed by said paper feeding roller; and

a paper sheet returning means associated with the release action of said cassette from said paper feeding section for bringing said feed roller and said paper sheet separating roller out of contact with each other and causing said return roller to rotate in the direction counter to the paper feeding direction, whereby the paper sheet gripped between said feed roller and said paper sheet separating roller is returned into said cassette.

4,616,820

MATERIAL HANDLING SYSTEM

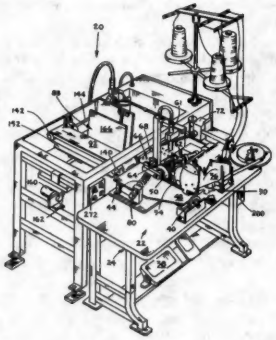
Kenneth J. Thompson, Lexington; Joel C. Rosenquist, Kernersville, and Wayne G. Foster, Advance, all of N.C., assignors to Sara Lee Corporation, Winston-Salem, N.C.

Division of Ser. No. 457,457, Jan. 12, 1983, Pat. No. 4,550,670.

This application May 3, 1985, Ser. No. 730,159

Int. Cl.[4] B65H *29/34*

U.S. Cl. 271—189 **5 Claims**



1. A stacking assembly for garment components and the like comprising: an elevator tray for receiving components on its upper surface for stacking, support means positioned above said elevator tray for sequentially receiving and releasing individual components for deposit upon said elevator tray, means including timer means for selectively actuating said support means to permit a garment component to drop therefrom and onto said elevator tray, elevator tray control means for selectively displacing said tray, said elevator tray control means including fluid means for displacing said tray in a generally vertical plane and sensor means for detecting the top portion of a stack of components upon said tray for controlling said fluid means for lowering said elevator tray as the stack of components builds up to maintain the top of the stack at a predetermined level, said control means also including timer means for facilitating precise stacking of the components and preventing inaccurate positioning of said stack tray by periodically positioning said elevator tray provided said sensor means does not detect the top portion of the stack of components.

4,616,821
SHEET IMAGING APPARATUS

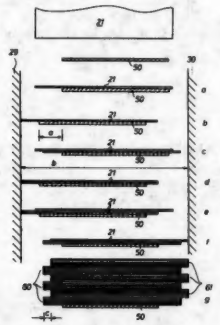
Gerard J. Boeve, and Etienne M. De Cock, both of Edegem, Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Mar. 25, 1985, Ser. No. 715,940

Claims priority, application European Pat. Off., Mar. 30, 1984, 84200453.3

Int. Cl.⁴ B65H *31/04*

U.S. Cl. 271—213 **5 Claims**



1. Sheet imaging apparatus wherein sheets are taken in succession from a supply stack of sheets, passed through an imaging station wherein an image is formed on the sheets, and then delivered one by one into a collecting tray, and wherein said collecting tray is provided with a sheet-supporting back plate movably mounted for back and forth movement in a direction transverse to the direction of sheet delivery, thereby to produce two part-stacks of sheets in the collecting tray, characterised in that said collecting tray comprises opposed stationary wall means spaced transversely of either lateral side of the sheet-supporting plate, and means for driving the back plate cyclically between transversely spaced dead end points in such a way that at one dead point of the movement a first group of sheets is received one-by-one on the sheet-supporting plate and at the other dead point such sheets are displaced by abutment against the corresponding stationary wall, thereby to form one part-stack of sheets, and that at said other dead point of movement a second group of sheets is received one-by-one on the back plate and at said first dead point said sheets of said second group are displaced by abutment against the corresponding stationary wall, thereby to form the other part-stack of sheets.

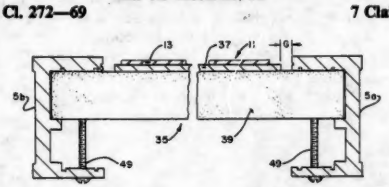
4,616,822
EXERCISE TREADMILL

James A. Trulaske, 609 Sunbridge Dr., and Frank R. Trulaske, 576 Sunbridge Dr., both of, Chesterfield, Mo. 63017

Filed Aug. 1, 1984, Ser. No. 636,747

Int. Cl.⁴ A63B *23/06*

U.S. Cl. 272—69 **7 Claims**



1. An exercise treadmill having a frame, said frame comprising a pair of spaced side members extending generally lengthwise of said treadmill, a pair of generally parallel, spaced rollers journaled on said side members and extending transversely between said side members, an endless belt entrained around said rollers, said belt having an upper reach on which a user of said treadmill runs or walks and a lower reach, means for driving one of said rollers and said belt, said belt moving along an endless path around said rollers, and means carried by said frame for supporting said upper reach of said belt and for effectively dissipating heat therefrom generated by the friction of said upper reach of said belt rubbing on said supporting means, said support means comprising a metal plate disposed generally at the elevation of said frame side members and below said upper reach of said belt having a length sufficient so as to substantially continuously support said upper reach between said rollers and a width somewhat less than the distance between said side members such that a gap is present between the sides of said plate and each of said side members, said support means further comprising a plurality of transverse beams disposed below said upper reach with said plate bearing thereon, said beams being secured to said side frame members and being spaced from one another, with the area of said plate in contact with said beams being small in relation to the area between said beams such that frictional heat generated by said rubbing on said plate is conducted from said belt into said plate, and such that relatively cool ambient air between the upper and lower reaches of said belt is heated by the lower face of said face, and such that the heated air is exhausted from the below said plate via said gaps, said beams being sufficiently flexible in vertical direction so as to at least in part cushion the impact of a runner's feet on said belt.

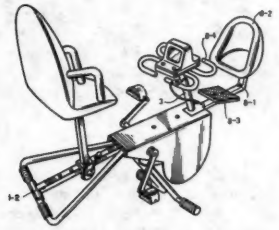
4,616,823
EXERCISE BICYCLE WITH INCLINED SEATS FOR TWO PEOPLE

Tai-Her Yang, 5-1, Tai-Pin Street, Si-Hu Town, Dzan-Hwa, Taiwan

Filed Aug. 14, 1984, Ser. No. 640,775

Int. Cl.⁴ A63B *23/04*

U.S. Cl. 272—73 **4 Claims**



1. An exercising device comprising:

a main frame for resting on a surface;

a subsidiary frame member, mounted to and supported by said main frame at an angle inclined with respect to said surface, said subsidiary frame member defining a plurality of apertures arranged along a common line on a first surface thereof;

an elongated supporting shaft having first and second ends;

a mounting plate fixed to the first end of said supporting shaft;

U-shaped flange means fixed to the second end of said supporting shaft, said flange means including a flat portion and at least first and second legs extending from said flat portion in a direction axial to said supporting shaft, said first and second ends spaced apart a distance exceeding at least one dimension of said subsidiary frame member first surface, said flange means further including a pin projecting axially therefrom between said first and second legs, said pin having a length which is less than the lengths of either of said first and second legs, said pin having a diameter which is slightly less than the diameter of any of said

plurality of apertures, said first and second legs defining first and second holes, respectively, in registry with one another, said flange means for reciprocally sliding along said subsidiary frame member and for engaging with a selected one of said plurality of apertures;

a locking means, extending through said hole in said first leg to said hole in said second leg, for pulling said first and second legs together and thereby retaining said elongated supporting shaft in a selected position whereat said pin extends into said selected one of said plurality of apertures;

a first seat fixed to said mounting plate; and

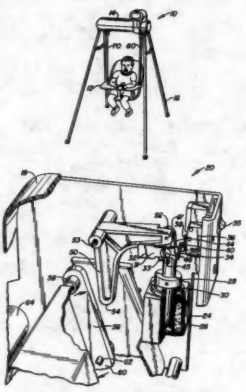
a first set of pedals, rotatably journalled to one of said main frame and said subsidiary frame member, for being rotated by the feet of a person seated in said seat.

4,616,824

ELECTRIC SWING

Robert L. Quinlan, Jr., Barberton, and Charles W. Lauro, Akron, both of Ohio, assignors to Gerber Products Company, Fremont, Mich.

Filed May 29, 1984, Ser. No. 615,402
Int. Cl.[4] A63G *9/16*
U.S. Cl. 272—86 **1 Claim**



1. An electric swing mechanism for exerting a swinging force on a swing hanger supporting a swing seat, comprising:

a low voltage direct current power source;

solenoid means mounted to the frame structure of the swing and linked to the power source for producing a motive force through a vertical piston when energized, the piston linearly reciprocating through the solenoid;

normally open switch means mounted to the frame for selectively energizing the solenoid when closed, said switch means further comprising a switch arm pivotally linked to engage a switch contact for closing said switch means, wherein said switch arm further comprises a roller;

link means having one end pivotally mounted to the top of said piston about an axis which is perpendicular to the central axis of the piston, said link means having an imbalanced actuator lever pivotally connected thereto, said imbalanced actuator lever pivoting in a pinned connection to the link means and, having an actuator head at one end with a curved edge surface shaped for closing the switch only in one direction of the stroke of the piston by causing the switch arm to abut against actuator stop means on said link means to engage the switch contact to close the switch on the downward stroke of the piston and causing the imbalanced lever to pivot and so rotate the roller along the curved surface edge of the actuator head of the lever without engaging the switch contact on the upward stroke of the piston; and

linkage means for linking the swing hanger to the link means by transmitting the motive force to the swing hanger via intermittent physical contact between the linkage means and the swing hanger, wherein said linkage means further comprises

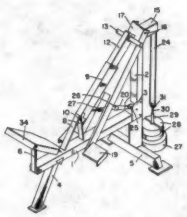
a driver arm, shaped like an inverted L, having one end pivotally linked to the other end of the link means, the other end free to intermittently contact the swing hanger with a pushing force, and the apex of said driver arm pivotally pinned to a frame structure for the swing.

4,616,825

AEROBIC EXERCISE MACHINE

Melvin J. Anderson, Rte. #1, Box 8800, Inkom, Id. 83245

Filed Mar. 4, 1985, Ser. No. 708,019
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—134 **6 Claims**



1. An aerobic exercising machine that works all the major body muscles simultaneously comprising:

a. a vertical beam having a cross arm at the foot end and a forward extension at the top end, said forward extension supporting a plurality of free weights;

b. a horizontal beam pivotally connected to said vertical beam by a plate means at approximately one third the height of said vertical beam;

c. a rear leg support pivotally connected to said horizontal beam at the end opposite said vertical beam connection;

d. an adjustable sloping seat bolted to a seat bracket attached to the horizontal beam above the rear leg support;

an adjustable sloping seat connected to said horizontal beam above said rear leg support;

e. a foot lever pivotally attached to the top of said vertical beam, the bottom end of said foot lever having a pair of foot pedals, said foot pedals straddling said horizontal beam;

f. a vertical support connected to said horizontal beam directly forward of said seat, said vertical support having a hand lever pivotally attached thereto, the upper end of said hand lever having a pair of handgrips;

g. a first pulley means operatively connected to said forward extension, a second pulley means operatively connected to said plate means, a third pulley means operatively connected to said hand lever, and a fourth pulley means operatively connected to said horizontal beam proximate said vertical support;

h. cable means having a first end connected to the bottom end of said foot lever and extending through said fourth pulley means, said second pulley means, said third pulley means, back through said second pulley means, through said first pulley means, and having a second end attached to said free weights;

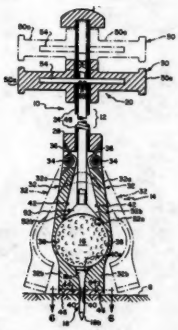
i. a digital counter at the top of said vertical beam and connected to the top end of said foot lever.

4,616,826

GOLF BALL AND TEE SETTING APPARATUS

George M. Trefts, 216-A Eagle Point, Punta Gorda, Fla. 33950

Filed Apr. 22, 1985, Ser. No. 725,933
Int. Cl.[4] A63B 57/00
U.S. Cl. 273—32.5 3 Claims



1. A unit for use in teeing a golf ball incident to driving a tee into the ground, said unit comprising in combination:

an elongated main frame element, said frame element includes a tubular member having a U-shaped mounting bracket fixed to its lower end, a knob fixed to its upper end and a pair of aligned, axially extending guide slots formed adjacent its upper end;

a retaining mechanism mounted adjacent a lower end of said main frame element, said mechanism including a pair of arms supported for relative movement between an adjacent retaining position and a remote releasing position, said arms having upper end and lower end portions, said upper end portions are supported by pivot pins bridging between legs of said mounting bracket and have facing cam follower surfaces, said lower end portions define recess means on facing surfaces thereof cooperating when said arms are in said retaining position for retaining a tee to extend generally coaxially with said main frame element with a head end of said tee supported by said arms and a pointed end of said tee projecting outwardly beyond said arms for insertion into the ground and for retaining a golf ball in essentially centered engagement with said head end of said tee, said lower end portions when said arms are in said retaining position limiting the extent of insertion of said pointed end of said tee into the ground by engagement with the ground, said arms when in said release position permitting said tee and golf ball to be removably inserted between said arms, and spring devices surrounding said pivot pins and engaging said arms and said mounting bracket for normally biasing said arms towards said retaining position; and

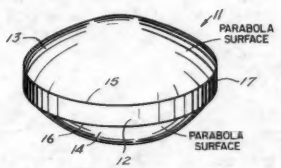
handle mechanism movably carried by said main frame element for controlling movement of said arms between said retaining and releasing positions, said handle mechanism including an operating member slidably received within said tubular member, a handle fixed to an upper end of said operating member by a mounting pin slidably received within said guide slots and a foot fixed to a lower end of said operating member, said foot having a lower surface arranged to engage with said golf ball when retained between said arms for applying pressure thereto for driving said pointed end of said tee into the ground and said foot having cam surfaces arranged to slidably engage with said cam follower surfaces for moving said arms towards said releasing position against the bias of said spring devices, when said foot is moved away from said golf ball and towards said mounting bracket incident to sliding movement of said operating member within said tubular member in a direction towards said knob.

4,616,827

PLAYING BALL

James H. Bergland, 102 York, St. Louis, Mich. 48880

Filed Aug. 23, 1984, Ser. No. 643,445
Int. Cl.[4] A63B 65/00, 41/00
U.S. Cl. 273—58 A 6 Claims



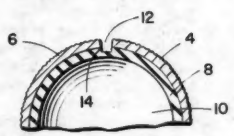
1. A playing ball having a circular center disc portion and having a parabola dome upper configuration and a parabola dome lower configuration, the base portion of said domes each peripherally connected to said disc.

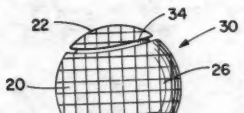
4,616,828

TENNIS BALL

James Haythornthwaite, 567 Main Road, Hudson, Quebec, Canada (J0P 1J0)

Filed Feb. 1, 1985, Ser. No. 697,237
Int. Cl.[4] A63B 39/06
U.S. Cl. 273—61 R 16 Claims





1. A tennis ball comprising:

a hollow spherical core;

two cover members having peripheral edges secured to said core and being spaced from one another along said edges; and

a groove in an outer peripheral surface of said spherical core, said groove being in alignment with and below said edges of said two cover members for controlling air turbulence around said tennis ball during its trajectory.

5. A tennis ball comprising:

a hollow spherical core;

two cover members having spaced apart peripheral edges, said two cover members being secured to an outer peripheral surface of said spherical core and substantially surrounding said spherical core, each of said two cover mem-

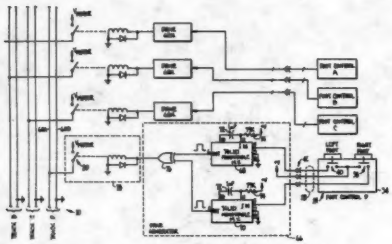
bers including synthetic fibers, said synthetic fibers extending at right angles toeach other and being sufficiently spaced from each other to expose portions of said outer peripheral surface of said spherical core for controlling air turbulence around said tennis ball during its trajectory.

4,616,829

APPARATUS FOR SIMULATING RUNNING GAMES

Melvin F. Smack, Sr., Valinda, and Garland J. Semien, Jr., Los Angeles, both of Calif., assignors to World Inventions, Valinda, Calif.

Filed Apr. 2, 1984, Ser. No. 595,913
Int. Cl.[4] A63F *9/14*
U.S. Cl. 273—86 B **17 Claims**



1. An apparatus for simulating a running contest comprising:
a track about which running contest is conducted;
movement indicator means positioned for movement on the track for indicating distance travelled by a contestant; and
means coupled to the movement indicator means for controlling the movement indicator means, including means operated by depressive foot movements in the form of running that are supplied by a user for generating control signals, wherein the amount of distance travelled indicated by the movement indicator means is a function of the control signals supplied from the controlling means, wherein the controlling means includes:
first activating means operated by the depressive foot movement of one foot of the user for providing a first signal;
second activating means operated by the depressive foot movement of the other foot of the user for providing a second signal; and
means coupled to the first and second activating means for transmitting control signals to the movement indicator means wherein the control signals are transmitted when either the first or the second, but not both activating means are being operated.

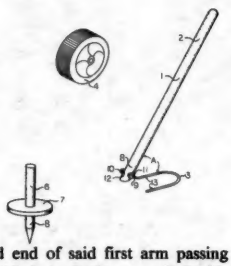
4,616,830

ROLLING HOOP GAME

Arnold R. Moore, 5901 Craig Rd., Box 54, Durham, N.C. 27712

Filed Sep. 17, 1985, Ser. No. 776,783
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—126 R **4 Claims**

1. A wheely-hoop game, comprising, in combination:
(a) a set of at least two marking pegs;
(b) a wheel having a circumferential edge, and further having a center of gravity such that it is substantially incapable of standing on its circumferential edge by itself;
(c) a guiding shaft having an upper end and a lower end, said lower end having a hole passing diametrically therethrough; and
(d) a U-hook having a first arm and a second arm, the end of said first arm being threaded and disposed in a perpendicular manner to the rest of said first arm but in a manner coplanar with said first and second arms;
said arms of said U-hook being of a length no greater than the diameter of said wheel;
said first and second arms being separated by a distance no less than the width of said wheel and no greater than the diameter of said wheel; and



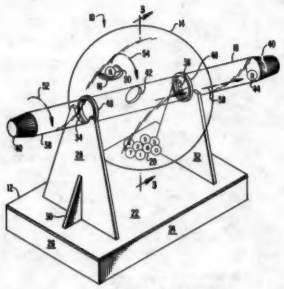
the threaded end of said first arm passing through the diametrical hole in the lower end of said guiding shaft, and further being secured thereto.

4,616,831

LOTTERY DEVICE

Ronald D. Testerman, 3810 Rock Run Rd., Havre DeGrace, Md.

Filed Aug. 14, 1985, Ser. No. 765,455
Int. Cl.[4] A63F *9/00*
U.S. Cl. 273—144 B **12 Claims**

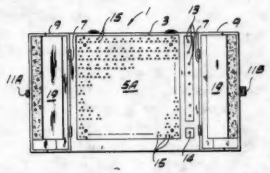


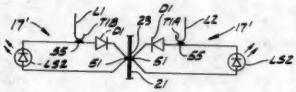
1. A device for selecting random numbers and other similar combinations, comprising:
a main base frame structure, said main frame having first and second surfaces, one of said surfaces being set at a higher elevation than the other of said first and second surfaces;
a globe like structure;
a tube-like member having an aperture provided in its side wall, said tube-like member being suitably located through and extending from each side of said globe-like structure and affixed thereto, said tube-like member being suitably removably affixed to said main base frame structure;
a pair of closure means, said pair of closure means being suitably affixed to said tube-like member, at least one of said pair of closure means being removably so affixed;
a ball selection means, said ball selection means being suitably affixed to the inside of said globe-like structure; and
a plurality of sequentially marked balls, said plurality of sequentially marked balls being located within said globe-like structure.

4,616,832
ELECTRICAL HIDDEN MOVEMENT GAME

Guy H. Groner, 32 Glen Aire Dr., Springfield, Ill. 62703

Filed Mar. 1, 1985, Ser. No. 707,238
Int. Cl.[4] A63F 3/00
U.S. Cl. 273—238 19 Claims





1. A game comprising:

a game board having at least a pair of substantially identical playing surfaces, one for each game player, with each playing surface positioned so that the playing surface for any one game player is obscured from the view of all other game players;

each playing surface having a plurality of receptacles, each representing a location for positioning a playing piece, said receptacles being arranged on the respective playing surfaces in substantially identical patterns, the receptacles on any one playing surface having respective correspondingly positioned receptacles on each other playing surface, a plurality of said playing piece receptacles on one playing surface each having an electrical terminal adapted to be commonly connected to one terminal of an A.C. power source, a plurality of said playing piece receptacles on a second playing surface each having an electrical terminal adapted to be connected to an opposite polarity terminal of the A.C. power source;

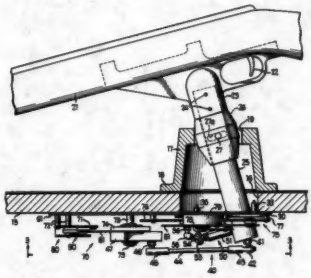
a plurality of first playing pieces each adapted to mate with any receptacle and having a pair of electrical contacts, a first diode connected across said contacts, and a second diode and an electrically powered light source also connected across said contacts with the anode of one diode and the cathode of the other diode being commonly connected to the same contact; each of said playing pieces having one of its contacts positioned to contact a receptacle terminal and its other contact positioned to be brought into electrical contact connection with the other contact of a playing piece positioned in a corresponding receptacle on a second playing surface whereby both light sources are energized.

4,616,833
TARGET SHOOTING GAME WITH PHOTOELECTRIC ORIENTATION SENSING APPARATUS

David A. Geller, Chicago, Ill., assignor to Wico Corporation, Niles, Ill.

Filed Mar. 11, 1985, Ser. No. 710,394
Int. Cl.[4] A63F 9/02
U.S. Cl. 273—313 6 Claims

1. In a target shooting game including a target assembly and a shooting device movable parallel to a plurality of predetermined planes for aiming, apparatus for sensing the direction in which the shooting device is aimed comprising: a plurality of photoelectric means equal in number to said planes, each of said photoelectric means including light source means for projecting a beam of light and light detecting means disposed for detecting said beam, a plurality of encoding members equal in number to and respectively corresponding to said photoelectric means and movable in parallel planes, each of said encoding members being positioned for intercepting the corresponding light beam and having a plurality of apertures therethrough dimensioned and arranged in accordance with a predetermined code, and a plurality of linkage assemblies connecting the shooting device respectively to said encoding members, each of said linkage assemblies being responsive to movement of the shooting device parallel to only a corresponding one of said planes to effect movement of only the corresponding one of

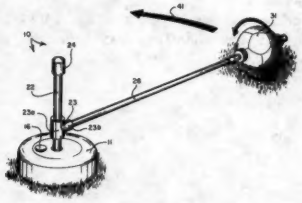


said encoding members for varying the positions on said encoding members at which said light beams are intercepted, each of said encoding members blocking selected portions of the corresponding light beam for encoding said beam to indicate the distance between the position on said encoding member at which said light beam is intercepted and a reference position thereon, each said light detecting means being responsive to the corresponding encoded light beam for generating signals indicative of the absolute position of the shooting device with respect to a predetermined reference position, whereby the signals from said plurality of light detecting means cooperate accurately to define the absolute orientation of the shooting device.

4,616,834
BALL-KICKING ASSEMBLY

Roy J. Davis, 940 Berkeley Ave., Menlo Park, Calif. 94026

Filed Apr. 12, 1985, Ser. No. 722,696
Int. Cl.[4] A63B 43/00, 69/00
U.S. Cl. 273—411 4 Claims



1. A ball kicking assembly comprising a mounting base of substantial mass, means carried to extend upwardly from said base for defining a pivot axis, an elongate semi-rigid radius arm, a ball carried by one end of said arm in a manner permitting the ball to rotate about the axis of said arm, the other end of said arm being coupled to the first named said means in a manner permitting said other end of said arm to travel freely

about and along said axis to permit said arm to rise and fall along said axis to dispose said arm to extend a radius from said axis at a position along said axis serving to locate the ball adjacent to support surface, the rigidity of said radius arm serving to cause the ball to travel a predictable path preventing the ball from travelling toward said axis.

4,616,835

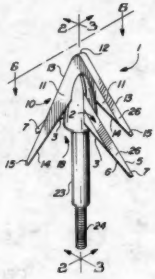
ARROW TIP

George H. Trotter, 7107 Janey St., Shreveport, La. 71108

Filed Apr. 24, 1985, Ser. No. 726,633

Int. Cl.[4] F41B *5/02*

U.S. Cl. 273—421 6 Claims



1. An arrow tip for removable mounting on an arrow shaft, said arrow tip comprising:

(a) a generally bullet-shaped blade mount and a threaded shank extending from one end of said blade mount from threadibly connecting said blade mount to the arrow shaft;

(b) a first V-shaped slot provided longitudinally in said blade mount;

(c) a base blade having a truncated tip and a pair of base blade legs inserted in said first V-shaped slot, said base legs extending from said first V-shaped slot in a selected angular relationship;

(d) a second V-shaped slot provided longitudinally in said blade mount, said second V-shaped slot located above said first V-shaped slot and substantially transversely oriented with respect to said first V-shaped slot; and

(e) a top blade having a sharpened tip and a pair of top blade legs inserted in said second V-shaped slot, said top blade legs extending from said second V-shaped slot in said selected angular relationship.

4,616,836

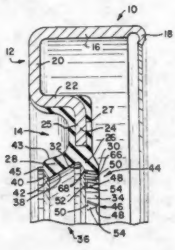
REVERSE LIP POSITIVE VENTING SEAL

Gordon T. Drygalski, Chicago, Ill.; Dennis L. Otto, Malvern, and Donald K. Ross, Eastlake, both of Ohio, assignors to Chicago Rawhide Mfg. Co., Elgin, Ill.

Continuation-in-part of Ser. No. 484,490, Apr. 13, 1983, Pat. No. 4,556,225. This application Dec. 2, 1985, Ser. No. 803,534

Int. Cl.[4] E16J *15/32*

U.S. Cl. 277—152 9 Claims



1. A fluid seal for retaining lubricant within a sealed region during relative movement of a first machine member and a shaft associated in use with said machine member, said seal comprising, in combination, a relatively rigid casing portion adapted to be received in fluid tight relation with respect to said first machine member, and a sealing lip body having portions adapted to contact said associated shaft, said casing including a mounting surface portion adapted for snug engagement with respect to said first machine member, and a bonding portion adapted to have a portion of an associated sealing lip body bonded thereto, said sealing lip body being bonded to said bonding portion of said casing and comprising a primary lip portion and an auxiliary lip portion, said primary lip portion being defined at least in part by an axially innermost, radially inwardly and axially inwardly extending, annular oil side surface, an axially spaced apart, generally frusto-conical air side surface, and an annular, primary seal band surface which is generally cylindrical in its relaxed condition and which extends between the innermost edges of said oil side and air side surfaces, said seal band surface having thereon at least one hydrodynamic pumping element, said element having a radially inwardly directed surface portion and at least one working surface, said auxiliary lip portion being defined in part by a first frusto-conical surface partially directed in use toward said shaft and away from said sealed region, and a second frusto-conical surface directed partially towards said shaft and partially toward said sealed region, said frusto-conical surfaces meeting each other along a generally circular locus to form an auxiliary lip seal band, said second surface defining said portion of said auxiliary lip and said air side surface of said primary lip being axially spaced from each other and at least partially defining therebetween an annular groove of generally V-shaped cross-section, said seal being adapted for reception over an associated shaft to provide a generally fluid tight seal, with said radially inwardly directed surface of said pumping element and said primary seal band dimensioned, in the relaxed condition of said seal, so that said pumping element surface and said primary seal band are spaced slightly apart from said associated shaft in use to provide vent means permitting the free passage of gas and vapor from said sealed region, without substantial prior pressure buildup in said region.

4,616,837

SEAL RING WITH TIPPABLY SUPPORTED GUIDE RING

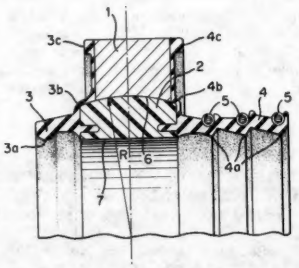
Achim Beutel, Weinheim, Fed. Rep. of Germany, assignor to H. Weissenfeld-Richters, Weinheim, Fed. Rep. of Germany

Filed Dec. 11, 1985, Ser. No. 808,006

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1985, 3501334

Int. Cl.[4] F16J *15/32*

U.S. Cl. 277—153 16 Claims



1. A seal ring, comprising:

a holding ring for fixedly mounting the seal ring on one machine part;

a guide ring axially concentric with the holding ring and tippably supported on one side of the holding ring, the other side of the guide ring being for guiding the seal ring on another, relatively-movable machine part; and

a resiliently-deformable sealing ring sealingly connected to the guide ring and having a sealing lip for sealing about the relatively-movable machine part.

4,616,838

WORK HOLDING DEVICES

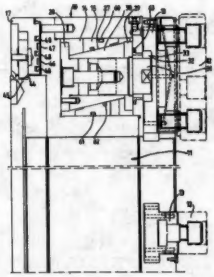
Joseph F. Jackson, Halifax, and Ralph A. Waite, Queensbury, Near Bradford, both of England, assignors to Pratt Burnerd International Limited, Halifax, England

Filed Aug. 23, 1983, Ser. No. 525,729

Claims priority, application United Kingdom, Aug. 28, 1982, 8224769

Int. Cl.⁴ B23B *31/30*

U.S. Cl. 279—4 **14 Claims**



1. A work holding device for holding a workpiece comprising:

a cylinder having an axis and a pair of axially spaced apart end walls;

jaws movably mounted on the cylinder for holding said workpiece and movable laterally of said axis toward and away from said workpiece;

motion translation means located entirely within said cylinder and including piston means located within said cylinder for moving axially therein;

jaw drive means located within said cylinder for moving said jaws laterally of said axis;

a plurality of passages extending through said piston means, each of passages being inclined with respect to the cylinder axis, and said jaw drive means including a plurality of jaw drive members, each jaw drive member associated with a respective passage, with a portion of each jaw drive member slidably received within the respective passage, and

said cylinder, said piston means, said jaw drive means and said motion translation means located proximate said jaws.

4,616,839

SHOPPING CART HAVING SOLID FLAT VERTICAL CONTAINER BASKET WALLS

Antoine Trubiano, Pointe aux Trembles, Canada, assignor to Cari-All Inc., Monreal East, Canada

Filed Dec. 31, 1984, Ser. No. 688,012

Int. Cl.⁴ B62B *11/00*

U.S. Cl. 280—33.99 R **3 Claims**

1. In a nesting shopping cart having a basket support frame supported on castors, a container basket secured to said support frame, a handle means for displacing said cart; said container basket having a bottom wall, a rear hinged gate wall, a front wall, opposed side walls and an open top end; the improvement comprising wherein at least said opposed side walls and said front wall of said basket are constructed at least in a major portion thereof as a solid flat removable panel having an information display on an outer surface thereof, said side walls and said front wall having a structural peripheral support frame having panel securement means wherein to secure thereto said side wall panels and said front wall panel, respectively; said panel securement means including a top and bottom one of said structural peripheral support frame, two or more transverse attachment bars secured between said top and bottom structural peripheral support frame with said panels being secured to said bars by fasteners, said top and bottom support

frame comprising a pair of straight steel wire rods spaced apart in a vertical plane and secured to an intermediate undulated intermediate structural steel wire rod, said channels being U-shape channels having an open end and secured to the inside of opposed outer ones of said pair of rods with said open ends facing one another whereby to slidingly receive said side wall and front wall panels.

4,616,840

MACHINE FOR UTILIZING ENERGY

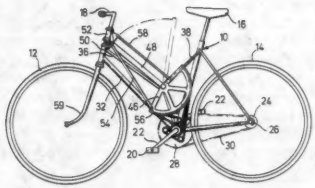
Francis H. Green, 97 Lawrie Park Gardens, London, England (SE26 6HW)

Filed Jun. 11, 1984, Ser. No. 619,115

Claims priority, application United Kingdom, Jun. 11, 1983, 8316073; Jan. 10, 1984, 8400575

Int. Cl.⁴ B62M *1/12*

U.S. Cl. 280—234 **10 Claims**



1. A machine for utilizing muscular energy, the machine comprising means for supporting the body of an operator, an output member in the form of a spindle rotatable about a spindle axis, first operating means to be driven by the operator's legs to turn the spindle, and a set of handlebars which can be gripped by the operator's hands and are connected to a horizontal pivot axis through a parallelogram linkage so that they can be moved backwards and forwards in a vertical arc by torso and arm movement to turn the spindle, and a means for converting alternating directional movement of said parallelogram linkage into rotational movement of said spindle in a single predetermined direction, wherein movement of the first operating means is independent of movement of the second operating means, and wherein the spindle is driven by the second operating means during both backward and forward upper body movement.

4,616,841
BUCKLING CONTROL SYSTEM FOR ARTICULATED VEHICLES

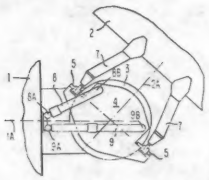
Bernhard Reichl, Stuttgart; Rudolf Maurath, Esslingen; Dieter Koch, Aichwald, and Gerhard Hametner, Unterensingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Feb. 17, 1984, Ser. No. 581,099

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1983, 3305751

Int. Cl.⁴ B62D *53/06*

U.S. Cl. 280—432 **13 Claims**



1. Anti-buckling control system for a steerable articulated vehicle of the type having a first steerable vehicular section hingedly connected to a second vehicular section, said first and second vehicular sections being configured to pivot with respect to one another and define a buckling angle therebetween during vehicle travel around curves and the like, said control system comprising:

buckling angle control device means interposed between the first and second vehicular sections to forceably control the buckling angle therebetween by providing a first resistance against a buckling angle increase,

vehicle velocity detecting means for detecting the velocity of the vehicle and supplying a vehicle velocity signal, and

computer control means for controlling the buckling angle control device means, said computer control means including:

(i) maximum buckling angle determining means for determining a velocity dependent maximum permitted buckling angle as a function of the vehicle velocity, said velocity dependent maximum buckling angle being the maximum buckling angle that will still result in essentially skid-free drive of the vehicle for the associated vehicle velocity, and

(ii) maximum buckling angle limiting means for controlling the buckling control device means to act against increases in the buckling angle beyond the determined velocity dependent maximum permitted buckling angle by providing a second increased resistance against a buckling angle increase in the buckling control device means only when said buckling angle approaches the velocity dependent maximum permitted buckling angle.

4,616,842
SKI

Michel Echevin, Meylan; Yves Piegay, and Maurice Legrand, both of Voiron, all of France, assignors to Skis Rossignol S.A.-Club Rossignol S.A., Voiron, France

Filed Apr. 12, 1984, Ser. No. 599,450

Claims priority, application France, Apr. 12, 1983, 83 06252

Int. Cl.⁴ A63C *5/075*

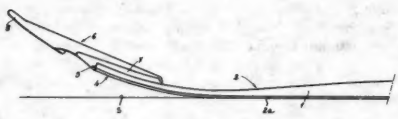
U.S. Cl. 280—602 **4 Claims**

1. An alpine ski comprising

an elongated ski body having a central portion terminating forwardly at an upwardly curved front end and terminating at the front end at a transverse leading edge, the body being primarily of a relatively dense and stiff material and having longitudinal edges;

a shovel-shaped element independent of the body and having a rear part formed with an indentation complementary to the transverse leading edge of the front end and an opposite tip, the element being continuous and primarily unitarily formed from the indentation to the tip of a material that is more supple and flexible than that of the body; and

means fixing the element at the indentation to the leading



edge of the front end against movement relative thereto, said element extending forward and upward from said indentation as an arcuate continuation of the front end of the body, the rear part being flush with the longitudinal edges of the body at the indentation where the element is secured to the front end of the ski body.

4,616,843
RELEASE SKI BINDING

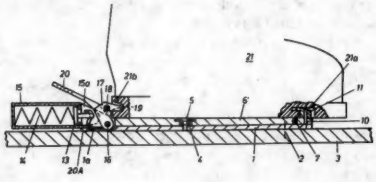
Henry Freisinger, Vienna; Franz Luschnig, Traiskirchen; Karl Stritzl, and Johann Zotter, both of Vienna, all of Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Dec. 19, 1984, Ser. No. 683,745

Claims priority, application Austria, Dec. 19, 1983, 4418/83

Int. Cl.⁴ A63C *9/081, 9/084*

U.S. Cl. 280—618 **13 Claims**



1. In a release ski binding comprising a sole plate having thereon a rear jaw for a ski shoe, a central part of said sole plate being pivotal relative to said ski about a vertically upright axle and about a transversely extending axle arranged in front of said vertical axle, said sole plate being held in a skiing position by an elastic holding mechanism on said ski, said holding mechanism beng responsive to a swivel movement occurring between said sole plate and said ski and upon reaching of a predetermined angle of traverse, effects an opening of a release locking means on said rear jaw, the improvement comprising wherein said sole plate consists of first and second parts, said first part being pivotally supported for movement about a vertical axis of a sleeve and said second part being hingedly connected to said first part through said transverse axle, wherein said first part, at its front end and in a vertical longitudinal center plane thereof, has a bolt thereon which is vertically upright on the upper side of said ski, on which bolt is pivotally supported a front jaw, and wherein said front jaw is adapted to be received in a recess in a sole of said ski shoe and has, spaced from the vertical longitudinal center plane, two control bolts, each having vertically upright axes, said control bolts being guided on a cam surface formed by a transversely extending front narrow side surface of a base plate.

4,616,844

MECHANISM FOR LOCKING OPENED STATE OF BABY CARRIAGE

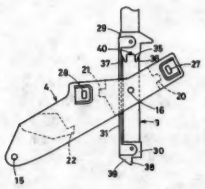
Kenzou Kassai, Osaka, Japan, assignor to Aprica Kassai Kabushikikaisha, Osaka, Japan

Filed Jun. 28, 1984, Ser. No. 626,110

Claims priority, application Japan, Jul. 15, 1983, 58-110370[U]; Nov. 4, 1983, 58-207729

Int. Cl.[4] B62B 7/08

U.S. Cl. 280—650 6 Claims



1. In a mechanism for locking the open and closed states of a foldable baby carriage having a pair of front legs (1), a pair of rear legs (2), a pair of push rods (3), and a pair of connecting rods (4) for turnably connecting, each at its opposite ends, the respective rear legs (2) and push rods (3), wherein an unfolded state of the baby carriage is locked when said push rods (3) and said connecting rods (4) associated therewith are in their straight state, while the folded state of the baby carriage is locked when said push rods (3) and said connecting rods (4) associated therewith in their folded position, the improvement comprising a first pivot point (15) located on one end of each said connecting rods (4) for turnably connecting each of said rear legs (2) to its respective connecting rod, a second pivot point (16) positioned substantially in the middle of each of said connecting rods (4) for turnably connecting each of said push rods (2) to its respective connecting rod, said second pivot point (16) being positioned a predetermined distance above the lower end of each push rod (3), so that in said unfolded state each of said push rods (3) and each of said connecting rods (4) overlap each other along said predetermined distance, wherein each of said push rods (3) comprises a lock operating member (29) positioned above said second pivot point (16) so that it is slidable in the direction of the length of the respective push rod, spring means (34) for constantly urging each lock operating member toward the lower end of the push rod (3), the lower end of each lock operating member (29) comprising a portion (35) for engaging said connecting rods, each of said connecting rods (4) comprising a first open state latch member (20) for cooperation with said engaging portion (35) when said lock operating member (29) is in its lower end position and in said unfolded state, and a closed state second latch member (21) for cooperation with said engaging portion (35) when said lock operating member (29) is in its lower end position and in said folded state, at least either said engaging portion (35) or said first and second latch members (20, 21) comprising inclined surfaces (36, 37) for leading the respective portion or member into automatic engagement against the force of said spring means (34) when they approach each other in the course of the opening and closing movements of said baby carriage, each of said lock operating members (29) having a first surface comprising temporary engaging means (40) opposed to the respective connecting rod (4) for temporary engagement with a second surface of the respective connecting rod; said second surface of each of said connecting rods (4) comprising unlocking and locking engaging means (27, 28) corresponding to said opened and closed states for cooperation with first and second latch members (20, 21), whereby when said lock operating member (29) slides on said push rod (3) toward the upper end of the push rod (3) against the force of said spring means (34), said temporary engaging means (40) engages said open or closed state engaging means (27 or 28) and said engaging portion disengages from said first or second latch members (20, 21), and wherein each of said lock operating members (29) is temporarily fixed for preventing sliding relative to each of said connecting rods (4).

4,616,845

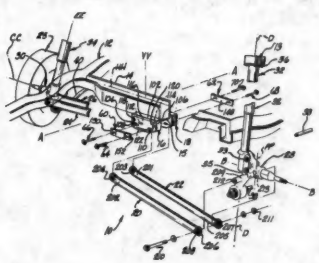
TOE ADJUSTMENT APPARATUS

Craig R. Pettibone, Lafayette, Colo., assignor to Specialty Products, Inc., Longmont, Colo.

Filed Jan. 18, 1985, Ser. No. 692,825

Int. Cl.[4] B62D 17/00

U.S. Cl. 280—661 37 Claims



12. A toe adjustment assembly for adjusting the toe of a rear wheel of an automotive vehicle comprising:

(a) an elongate plate having a recessed portion therein defining two transversely extending parallel cam engaging surfaces and having a longitudinally extending slot provided in said recessed portion of substantially identical size and shape as a frame slot provided in a cross member portion of a vehicle frame, said frame slot extending laterally of the vehicle central longitudinal axis;

(b) at least one cam assembly adapted to coact with said elongate plate, said frame slot and a vehicle control arm, said cam assembly comprising:

(i) a shaft portion having a central longitudinal axis and being adapted to be received in laterally shiftable relationship in same cam plate slot and said frame slot and adapted to be received in laterally nonshiftable relationship in a bore portion of said vehicle control arm; said shaft portion having a torque tool engaging portion at a first end thereof and a threaded portion adapted to accept a nut at a second end thereof;

(ii) a disc portion having a central longitudinal axis and a cylindrical periphery adapted to engage said cam engaging surfaces of said elongate plate and having a diameter slightly less than the distance between said cam engaging surfaces, said disc portion being affixed to said shaft portion proximate a first end thereof, said shaft portion passing through said disc portion; said shaft central longitudinal axis being positioned in parallel offset relationship with said disc central longitudinal axis; and

(iii) a nut means mountable on said threaded portion for axially urging said elongate plate, an end portion of said control arm and a portion of said vehicle frame into longitudinally fixed relationship;

(c) said elongate plate being adapted to be secured to and remain in laterally fixed relationship with said vehicle frame by said cam means; said cam means being constructed and arranged whereby said cam disc portion is displaceable in a direction parallel said cam engagement surfaces and whereby said cam shaft portion is displaceable laterally along said frame slot and said plate slot by rotation of said cam assembly about said cam shaft central longitudinal axis; said lateral displacement of said cam shaft causing lateral displacement of said control arm relative the vehicle central longitudinal axis whereby the

toe of an associated rear wheel assembly is selectively adjustable.

4,616,846

CONTROL DEVICE FOR A SUSPENSION

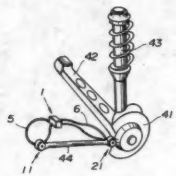
Kunitaka Furuya; Hiromi Inagaki; Kiyoshi Koga; Masaru Yorita; Tsunehiko Fukatsu, and Kazuo Matsuura, all of Tochigi, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 13, 1985, Ser. No. 765,341

Claims priority, application Japan, Aug. 14, 1984, 59-169839; Aug. 14, 1984, 59-169840; Aug. 14, 1984, 59-169841; Aug. 14, 1984, 59-169842

Int. Cl.[4] B60G *17/04, 15/00*

U.S. Cl. 280—673 **16 Claims**



1. A control device in a suspension having a link rod in a vehicle including a vehicle body and a steering wheel, comprising:

a pair of fluid-sealed bushings provided on the respective opposite ends of the link rod and having hydraulically adjustable compliances;

valve means for varying the compliances of said fluid-sealed bushings;

an actuator for actuating said valve means; and control means for controlling said actuator.

4,616,847

SUSPENSION SYSTEM FOR VEHICLE

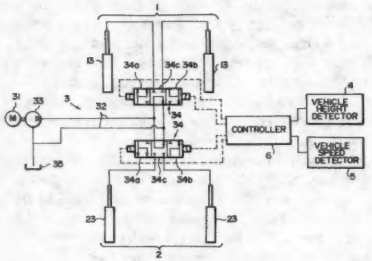
Seita Kanai, and Takashi Hirochika, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed Mar. 28, 1985, Ser. No. 716,947

Claims priority, application Japan, Apr. 2, 1984, 59-66597

Int. Cl.[4] B60G *11/28*

U.S. Cl. 280—707 **11 Claims**



1. A vehicle suspension system comprising a front suspension for supporting the front wheels, a rear suspension for supporting the rear wheels, an adjustable-height supporting means which connects the front and rear suspensions to the vehicle body and supports the vehicle body to be variable in height with respect to the front and rear suspensions, a vehicle speed detecting means which detects the vehicle speed, and a control means which receives the output of the vehicle speed detecting means and controls the adjustable-height supporting means so that the vehicle height is increased during low speed travel and is reduced during high speed travel, said front and rear suspensions being arranged so that the rate of change of the roll center height due to bump/rebound is larger in the rear suspension than in the front suspension.

4,616,848

AUTOMOTIVE SUSPENSION CONTROL SYSTEM WITH VEHICLE SPEED-DEPENDENT DAMPING CHARACTERISTICS

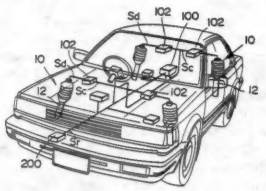
Fukashi Sugasawa; Junsuke Kuroki, and Yohsuke Akatsu, all of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 3, 1985, Ser. No. 771,766

Claims priority, application Japan, Sep. 6, 1984, 59-187152

Int. Cl.[4] B60G *11/00*

U.S. Cl. 280—707 **17 Claims**



1. A suspension control system for an automotive vehicle comprising:

a damper means interpositioned between a vehicle body and a road wheel for absorbing, at least in part, relative displacement between the vehicle body and the road wheel, said damper means having variable damper characteristics;

a first sensor detecting roughness of the road surface and producing a first sensor signal having a value variable depending upon roughness of the road surface;

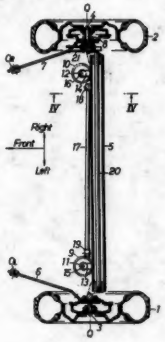
a second sensor detecting vehicle speed and producing a second signal having a value variable depending upon vehicle speed; and

a controller associated with said damper means for normally operating the latter in said first softer damping characteristics mode, said contrller being responsive to said second sensor signal for detecting the second sensor signal value within a given range representing a specific vehicle speed range, which given range being defined by an upper reference value representative of an upper vehicle speed criteria and a lower reference value representative of a lower vehicle speed criteria, comparing said second sensor signal value with said upper and lower reference values to determine whether the vehicle speed is within said given range or not, and varying variation characteristics of variable damping characteristics of said damper means in such a manner that, when said second sensor signal value is out of said given range, said controller derives sensing ability of road roughness and/or hardening magnitude of said variable damping characteristics damping means at relatively higher level, and when said second sensor signal value is within said given range, said controller derives sensing ability of road roughness and/or hardening magnitude of said variable damping characteristics damping means at relatively lower level.

4,616,849
TRAILING LINK BEAM SUSPENSION

Yoshiyuki Matsumoto, Tokyo, and Hideki Maru, Wako, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 8, 1984, Ser. No. 578,358
Claims priority, application Japan, Sep. 27, 1983, 58-178500
Int. Cl.[4] B60G *11/16*
U.S. Cl. 280—724 **11 Claims**

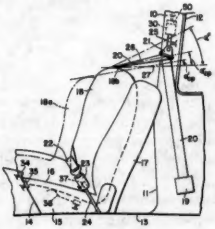


1. A trailing link type beam suspension for a vehicle having a chassis with left and right sides and a longitudinal axis, said beam suspension comprising: a pair of left and right trailing arms; an axle beam fixed to one of said trailing arms and pivotally connected to the other of said trailing arms; said axle beam supporting a pair of left and right wheels for rotation about an axis; said other trailing arm being pivotably connected to said axle beam for rotation about the axis of rotation of the wheels, said axle beam being rotatable where it is connected to said other of said trailing arms for rotation about the axis of rotation of the wheels and a pair of dampers mounted between said axle beam and the chassis of a vehicle; said axle beam being disposed in a position displaced from the axis of rotation of the wheels in the longitudinal direction of the chassis, said dampers being operative along axes which pass through the axis of rotation of the wheels.

4,616,850
AUTOMATIC HEIGHT ADJUSTMENT DEVICE

Gerhard Sedlmayr, Hamburg, Fed. Rep. of Germany, assignor to Autoflug GmbH, Rellingen, Fed. Rep. of Germany

Filed Nov. 21, 1984, Ser. No. 673,565
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1983, 3342203
Int. Cl.[4] B60R *21/10*
U.S. Cl. 280—808 **20 Claims**



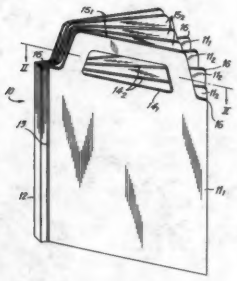
1. An apparatus for automatically adjusting the height of the upper attachment or guide fitting for the shoulder strap of a safety belt system, said apparatus including means for adapting the height position of said attachment or guide fitting to the seated position of the person who is to be strapped in position in order to achieve an optimum belt position, and also including a sensing device associated with said attachment or guide fitting for sensing the position of said shoulder strap with respect to at least one parameter of its operative connection with the person strapped in, and for triggering a reaction from said adapting means to the situation ascertained;

the improvement comprising an arrangement including an electronic value detection and computing system operatively connected to said sensing device for comparing the actual value detected with respect to said at least one parameter with a fixed desired value, said reaction being triggered if a predetermined deviation between said desired value and said actual value is continuously exceeded so that only angular changes above this deviation lead to triggering of the reaction.

4,616,851
BOOK STRUCTURE

Philip Mann, New York, N.Y., assignor to Tuffy Books, Inc., Harrison, N.Y.

Continuation of Ser. No. 394,273, Jul. 1, 1982, abandoned. This application Jan. 28, 1985, Ser. No. 695,417
Int. Cl.[4] B42D *1/00*
U.S. Cl. 281—15 R **5 Claims**



1. A children's book comprising a plurality of substantially identical sheet members each having a top edge, a bottom edge, a spine edge and an outer edge, said sheet members respectively constituting a pair of covers and leaves therebetween and being fastened together adjacent to said spine edges to form a spine and to permit relative angular displacements of said sheet members about said spine for opening and closing the book; wherein:

all of the sheet members are formed of a substantially stiff cardboard-like material;

all of said sheet members having substantially identical elongated openings extending therethrough adjacent to at least one of said top and outer edges,

said openings are aligned when the book is closed; and

said openings are accessible from opposite sides of the book when the book is closed to form a handle portion in the book and are large enough that a child's hand can be extended through the openings for carrying the book, thereby inducing the child to carry and read the book.

4,616,852
MONEY DEBIT CARD APPLICATION FORM AND METHOD OF PROCESSING SAME

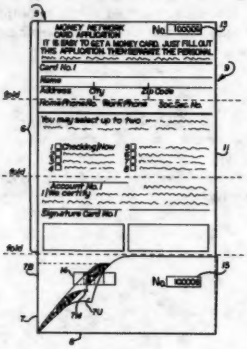
David J. Cash, 1000 Sixty Fourth St., LaGrange, Ill. 60525

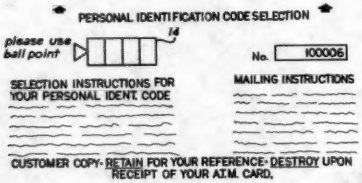
Filed Nov. 26, 1984, Ser. No. 674,564
Int. Cl.[4] B41L *1/22*
U.S. Cl. 282—27 R **6 Claims**

1. As an article of manufacture, a printed form comprising a

manually detachable first and second sections, with each side of said form bearing reading matter of differing content the entire first section further comprising on one side an application for issue of a money account debit card that is adapted for use in automatic computing machines and bearing an overt serial number on said one side, and the obverse side of which form has in part a return mail legend directed to a debit card issuing agency, the separable second section further comprising a three sheet form, which sheets are manually detachable from each other with the obverse side of the lowest sheet consisting of a second return mail legend directed to the same card issuing agency, said the second section further comprising the following elements:

a. a printed instruction top sheet providing space for entry of




PERSONAL IDENTIFICATION CODE SELECTION
please use ball point
14
No. 100006
SELECTION INSTRUCTIONS FOR YOUR PERSONAL IDENT. CODE
MAILING INSTRUCTIONS
CUSTOMER COPY- RETAIN FOR YOUR REFERENCE- DESTROY UPON RECEIPT OF YOUR AT.M. CARD.

a several digit number to constitute the personal identification number (PIN) of the card applicant and also reciting instructions for proper disposition of the second section components after their separation from the upper first section;

b. a paper sheet interleafing the front and back sheets and adapted to record the number manually entered on the front side of the front sheet to the front side of the back sheet;

c. the back sheet being adapted to permanently record the said entry number on its face as an identification code; and

d. both of the top and back sheets displaying the said serial number as in the first section, thereby serving to correlate the biographical data of said applicant with said identification number when needed.

4,616,853

FOOD SERVER AID

Anita Pensavecchia, P.O. Box 503, Lake Orion, Mich. 48035

Filed Oct. 29, 1984, Ser. No. 665,554

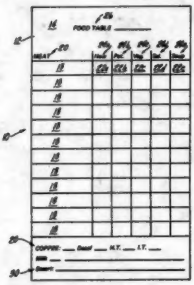
Int. Cl.[4] **B42D** *15/00;* **B41L** *1/24*

U.S. Cl. 283—60 A **2 Claims**

1. A food server aid comprising:

a pad of sheets, each sheet printed on both sides and being roughly four inches wide and seven inches high;

one side of each sheet printed with an array of blank spaces and associated notations comprising a vertical series of blank spaces formed by a grid of printed lines arranged beneath a notation designating the spaces as a location to mark main course food items, a plurality of rows corresponding to blank spaces formed by a grid of printed lines aligned horizontally with a respective one of said first-mentioned main course blank spaces, each of said blank spaces in said rows vertically aligned beneath notations



indicating respectively the degree of cooking of the main course food item, the type of potato, vegetable, salad dressing and soup;

the other side of each of said sheets printed with notation indicating a listing of alcoholic and other beverages and the manner of serving of at least some of such listings of beverage;

both sides of said sheets printed with a notation and space for indicating the table identification.

4,616,854

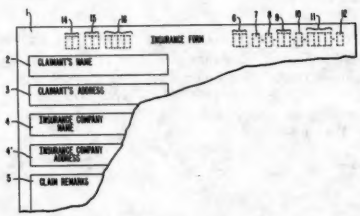
INSURANCE FORM INDICIA SYSTEM

Van O. Landrum, P.O. Box 514, Moss Point, Miss. 39563, and Hollis T. Landrum, First United Methodist Church, P.O. Box 72, Brandon, Miss. 39042

Filed Jul. 16, 1985, Ser. No. 755,344

Int. Cl.[4] **G09C** *1/06;* **B42D** *15/00*

U.S. Cl. 283—74 **6 Claims**



1. An insurance claim form comprising a plurality of first pattern areas including data representing identity of an insurance claimant and identity of a health insurance company,

a plurality of second pattern areas including symbols sensible by optical character recognition technique,

each second pattern area being spaced from all others of said second pattern areas so as to isolate the sensing of said each second pattern area from the sensing of all other second pattern areas in order to prevent erroneous sensing,

said symbols carried in at least one of said second pattern areas being correlated in a predetermined manner with at least one datum entered in one of said first pattern areas,

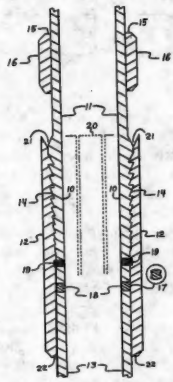
wherein at least one of said first pattern areas includes data corresponding to one of the insurance claimant's name, the insurance claimant's address, the name of a health insurance company against which a claim is filed, the address of a health insurance company against which a claim is filed.

4,616,855

THREADLESS NONROTATING STEEL COUPLING SYSTEM

James L. Ruhle, 2535 E. Balfour Ave., Fullerton, Calif. 92634

Filed Oct. 29, 1984, Ser. No. 665,996
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—24 **1 Claim**



1. A quickly-coupled and quickly-uncoupled threadless non-rotating steel coupling system having a central passage therethrough comprising:

a steel male half-coupling that contains around its circumference a first set of a plurality of circular saw-toothed ridges and grooves which become progressively smaller in the direction of the distal end of the steel male half-coupling, one side of the groove being at right angles to the longitudinal axis of the coupling and the other side of the groove sloping radially outwardly away from said distal end, a steel female half-coupling that is partially divided longitudinally into a plurality of flexible steel fingers and contains a second set of saw-toothed ridges and grooves that match said first set and mate there with and which become progressively smaller toward the proximal end of the steel female half-coupling, said female half-coupling having slots therein which extend longitudinally from the open end thereof toward said proximal end; drive shoulders means fixed to the male half-coupling rearwardly of said first set of saw tooth ridges and grooves for engagement by tool means to force the rigid steel male half-coupling into said steel female half-coupling spreading said flexible steel fingers as said saw-toothed ridges ratchet past each other; said male half-coupling having a beveled surface spaced rearwardly of said first set of saw-toothed ridges and grooves, said female half-coupling having a beveled surface formed on the interior surface at the terminal end thereof opposite said distal end, said beveled surfaces intersecting when the two half-couplings are completely joined together defining a V-shaped annular groove therebetween opening toward said drive shoulder means so that a tool may be inserted thereinto to simultaneously spread said fingers to allow said couplings to be separated, a compressible gasket positioned between said couplings and compressed thereby to seal the coupling system when the two half-coupling are completely joined together, which, in the uncompressed state is concave on its inner and outer side edges and convex on its top and bottom surfaces,

the same gasket, which is transformed in the compressed state when both half-couplings are completely joined together, into a gasket that has straight-sided edges and straight-sided surfaces on the top and bottom of the gasket resulting in an internally-flush central passage through the coupling system.

a pair of steel pins which are permanently affixed to the distal end of the male half-coupling, and occupy said slots in the female half-coupling so as to guide and lock the two half-couplings together in such a manner that rotation of one with respect to the other cannot occur.

4,616,856

NOZZLE AND RETAINING ARRANGEMENT

Henry W. Kowalyshen, Chicago, Ill., assignor to S&C Electric Company, Chicago, Ill.

Filed Apr. 25, 1985, Ser. No. 726,860
Int. Cl.[4] A16L *15/00*
U.S. Cl. 285—92 **8 Claims**

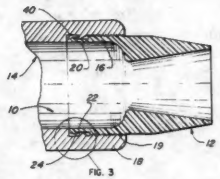


FIG. 3

1. An arrangement for retaining a first member within a second member, the first member including outer threads and the second member including mating internal threads, wherein the improvement comprises a first protruding ridge formed on the outside of the first member at a predetermined location, and a second protruding ridge formed on the inside of the second member at a predetermined location, said first and second members being circumferentially continuous at said predetermined locations, upon engagement of the first member into the second member said first ridge moving over and past said second ridge, upon subsequent continuing engagement to a predetermined point of engagement of the two members said first and second ridges interfering in the direction of disassembly of the two members, one of the members in the vicinity of said respective ridge being resiliently deformable with respect to the engaged portion of the other member.

4,616,857

BI-DIRECTIONAL SELF-RETAINING CYLINDRICAL SURFACE SEAL

Daniel C. Woodman, Torrance, and Stephen A. Neely, Long Beach, both of Calif., assignors to Hughes Tool Company, Houston, Tex.

Continuation of Ser. No. 554,742, Nov. 24, 1983, abandoned.
This application Feb. 19, 1985, Ser. No. 702,853
Int. Cl.[4] F16J *15/02*; F16L *19/03*
U.S. Cl. 285—140 **2 Claims**

1. In a supporting connection system for a subsea well having a multi-sectioned riser run from a floating vessel to the well of the type having a termination head removably mounted within a termination housing and having adapter means for co-axially engaging an uppermost section of the riser run, and hose means connected between ports in the termination housing and vessel, the improvement comprising in combination:

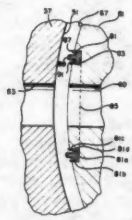
a longitudinal bore formed in the termination housing having an open top and bottom, the bore having an annular face formed therein that is curved in a vertical direction and has a greater diameter at the top of the face than at the bottom;

an annular face formed in the exterior of the termination head that is curved in a vertical direction the same as the face of the housing for mating with the face of the bore;

at least one passageway formed in the termination head and extending inward from the face of the termination head for aligning with one of the ports in the housing;

a groove formed in one of the mating faces, encircling the passageway in that face, the groove having a depth that varies continuously with the curvature of that face, the groove having a flat bottom located in a single plane, the groove also having an inner sidewall and an outer sidewall, said inner sidewall being greater in depth than said outer sidewall the groove having its maximum depth along opposing diametric portions of the groove about points intersected by a single first diametric line, the groove decreasing in depth from the maximum on either side of said first diametric line, the groove having its minimum depth along opposing diametric portions of the groove about points intersected by a single second diametric line perpendicular to said first diametric line, the groove having the inner sidewall of greater depth than the outer sidewall at said second diametric line, the groove increasing in depth from the minimum on either side of said second diametric line, the groove varying in depth symmetrically from the maxmium to minimum depths on either side of said first diametric line; and

an elastomeric seal ring located in the groove having a cross-sectional thickness that varies along its diameter in the same manner as the groove, the seal ring having an



inner wall and an outer wall connected by a flat bottom wall, the inner wall having a greater height than the outer wall at said second diametric line, the seal ring having its maximum cross-sectional height along opposing diametric portions of the seal ring about points intersected by said first diametric line, the cross-sectional height decreasing in depth from the maximum on either side of said first diametric line, the seal ring having its minimum cross-sectional height along opposing diametric portions of the seal ring about points intersected by said second diametric line, the cross-sectional height increasing in depth from the minimum on either side of said second diametric line, the seal ring varying in height symmetrically from the maximum to minimum heights on either side of said first diametric line, the seal ring having an inner lip, an outer lip and a central lip separated from each other by annular recesses, the inner and outer lips protruding outwardly from the groove and the central lip protruding outwardly from the groove greater than the inner and outer lips for contact with the corresponding mating face to deform the ring and press the inner and outer lips into sealing contact with said mating face; the annular recesses varying continuously in distance to the bottom of the seal ring with the variance in cross-sectional thickness of the seal ring;

the difference in depth of the inner and outer sidewalls of the grooves, and the differences in height of the inner and outer sidewalls of the seal ring providing a uniform protrusion of the seal ring from the groove for sealing against said mating face.

4,616,858

FLEXIBLE PIPE COUPLING

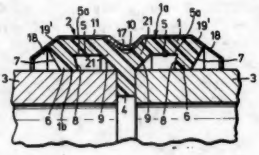
Heinz Sauer, Ronneburg, Fed. Rep. of Germany, assignor to Rasmussen GmbH, Maintal, Fed. Rep. of Germany

Filed Oct. 24, 1984, Ser. No. 664,346

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1983, 3339169

Int. Cl.[4] F16L *21/00*

U.S. Cl. 285—235 **20 Claims**



1. A coupling for the establishment of a fluidtight connection between the neighboring end portions of two pipes, comprising a deformable elastic sleeve having two open ends, an external surface, an internal surface, a substantially centrally located annular partition extending from said internal surface and disposed between the end portions of the pipes which are inserted into the sleeve through the respective open ends, two inner circumferential grooves provided in said internal surface at the opposite sides of said partition, and a third circumferential groove provided in said external surface; and a clamping unit including a split ring surrounding said external surface and having a first corrugation extending into said third groove, said ring further having two outwardly extending projections which are relatively movable between a first position in which said projections are separated by a first distance as considered circumferentially of said ring and a second position in which said projections are separated by a smaller second distance as considered circumferentially of said ring, and said clamping unit further having tightening means for drawing said projections from said first position to said second position to thereby tighten said ring around the external surface of and deform said sleeve, said clamping unit also including an arcuate insert which bridges at least the major part of the gap between said projections in said first position and is at least partially disposed between said ring and the external surface of said sleeve in said second position, and said insert having a second corrugation extending into said third groove and receiving the adjacent portion of the first corrugation in said second position.

4,616,859

QUICK-COUPLING CONNECTOR

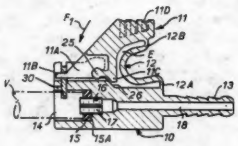
Patrice Brunet, Neuilly-sur-Seine, France, assignor to Poutrait-Morin, Aubervilliers, France

Filed Jan. 16, 1985, Ser. No. 691,766

Claims priority, application France, Jan. 16, 1984, 84 00562

Int. Cl.[4] F16L *39/00*

U.S. Cl. 285—317 **15 Claims**



1. A quick-coupling connector for an air valve, said connector comprising a hollow body having a first orifice adapted to be connected to the air valve and a second orifice in communi-

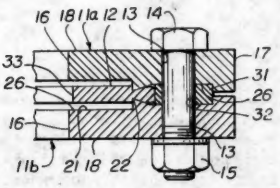
cation with said first orifice and adapted to be connected to a hose for supplying compressed air, an operating member, mounting means rockably mounting said operating member on said body about a pivot axis, a spring biasing said operating member to an operative position, a clamping member for clamping the air valve to said body, said clamping member being controlled by said operating member and being slidably mounted on said body between a clamping position under the bias of said spring for temporarily securing said connector to the air valve and a retracted position for positioning said connector on and removing said connector from the air valve, the improvement wherein said operating member and said spring are of one-piece molded construction with there being a strap defining said spring and joining said operating member to said body.

4,616,860

SEAL STRUCTURE FOR METAL VACUUM JOINT

Carl R. Faria, San Leandro, and Thomas W. Snouse, Fremont, both of Calif., assignors to Thermionics Laboratory, Inc., Hayward, Calif.

Filed Mar. 12, 1984, Ser. No. 588,452
Int. Cl.[4] F16L *19/00*
U.S. Cl. 285—336 **3 Claims**



1. A vacuum joint comprising a pair of spaced flange members adapted for relative movement along a longitudinal axis, each said member having facing surfaces normal to said axis, each said facing surface having an inner edge and outer edge, each said facing surface being formed with a milled annular inner groove having an outer edge parallel to said axis, a milled annular outer groove having an outer shoulder, a milled annular slanted surface extending radially inwardly and axially toward the opposite member from the outer edge of said inner groove in a sharp corner spaced inward from said inner edge,

an annular soft metal gasket of substantially rectangular cross-section between said flange members extending outward of said sharp corners and inward of said sharp corners,

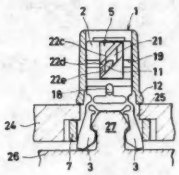
a spacer ring discrete from said members and from said gasket filling said outer groove and abutting said outer shoulder and having a thickness to hold said facing surface spaced apart, said deformable member being initially of slightly smaller outside dimension than the inside dimension of said spacer ring, said spacer ring confining deformation of said deformable member when said flange members are drawn together to cause said deformable member to seal against said sharp corners and said slanted surfaces, said sharp corners being closer together than said portions of said facing surfaces outside said outer grooves, said inner and outer grooves, said slanted surface, said deformable member and said spacer ring being non circular.

4,616,861

LOCK DEVICE

Mutsuo Kurosaki, Yahata, Japan, assignor to Nifco, Inc., Yokohama, Japan

Filed Jul. 17, 1985, Ser. No. 755,868
Claims priority, application Japan, Jul. 23, 1984, 59-151184
Int. Cl.[4] E05C *19/02*
U.S. Cl. 292—6 **1 Claim**



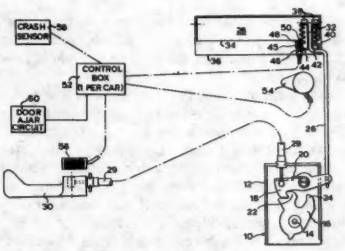
1. A lock device which is locked by a first push and unlocked by a second push comprising: a case open at one end and provided with a spring formed in one face, said spring having on its tip an inward-facing projecting portion; a slidable engaging piece housed in the case, said engaging piece being provided with a transverse guide groove; a spring which constantly urges said engaging piece towards the opening of the case; and a cam plate interposed between the engaging piece and the wall of the case, one face of said cam plate being provided with a ridge which slidably engages with said transverse guide groove of the engaging piece and the other face being provided with a one-way passage loop in which said projection engages; a first push of the engaging piece moving said projecting portion along said one-way passage loop and the cam plate laterally along the guide groove, guiding the projecting portion into engagement with an engaging portion provided partway along said passage, putting the device into the locked state, and a second push disengaging the projecting portion from said engaging portion and transversely returning the cam plate, putting the device into the unlocked state.

4,616,862

ELECTRICALLY CONTROLLED DOOR LOCKING SYSTEM

Marcus J. S. Ward, Billericay, United Kingdom, assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 12, 1985, Ser. No. 754,806
Claims priority, application United Kingdom, Jul. 14, 1984, 8417983
Int. Cl.[4] E05C *3/26*; E05B *5/00*
U.S. Cl. 292—201 **14 Claims**



1. A vehicle door locking system comprising a door latch mechanism and an outside door handle mounted on a vehicle door, characterized in that the handle is connected to the latch mechanism by means including a pneumatic bellows having an electrically actuated valve, the bellows being sealed when the

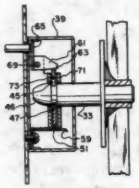
valve is closed to transmit movement of the handle to the latch mechanism and the bellows being deflated by movement of the handle when the valve is open without transmitting handle movement to the latch mechanism.

4,616,863

LOCK FOR RELEASABLY HOLDING A HINGED GUARD ELEMENT ON A WINDOW

Edgar E. Bryant, Mingus, Tex., assignor to Ultimate Security Products Corp., Fort Worth, Tex.

Filed Jul. 6, 1984, Ser. No. 628,638
Int. Cl.[4] E05C *1/12, 19/00*
U.S. Cl. 292—302 **3 Claims**



1. A lock for releasably holding closed to a fixed structure such as a building or the like a hingedly mounted closing element such as a guard element on a window, consisting essentially of:

a. a lock bar means for being locked in a closed position; said lock bar means having a penetrating end with a shoulder and adjacent recessed groove on at least two sides; said lock bar means being connectable with said guard element that are hingedly mounted over said window opening;

b. a lock housing that is connectable with the building and has interiorly thereof a latch means for locking said lock bar means in the closed position; said latch being inaccessible to an outsider when said lock bar means is inserted and in the closed position; said latch means being operable atuomatically to lock said lock bar means in the closed position when said lock bar means is pushed into the closed position; said latch means being accessible to an insider and operable to release said lock bar means when pushed by a push bar means; said latch means including:

i. a trapped slideable release bar having an aperture adapted to receive said penetrating end of said lock bar means and an extended aperture segment of smaller dimensions defined by sides adapted to engage said recessed groove on said lock bar means;

ii. biasing means for biasing said release bar to engage said sides of said extended aperture when said recessed groove is disposed adjacent thereto by pushing said penetrating end of said lock bar means into said aperture;

iii. release bell crank pivotally mounted and having a release arm positioned to push said release bar and release said penetrating end of said lock bar means when pivoted; and

iv. means for pivoting said release bell crank; and

c. said push bar means for releasing said lock bar means, said push bar means being accessible and operable by said insider; said push bar means comprising two portions, an interior portion extending interiorly of said building disposed in a wall aperture for pushing on said latch means to release said lock bar means; and an exterior portion; said exterior portion comprising a small diameter shaft with a shoulder on its interior end with a retainer washer on its exterior end; and a first small diameter passageway encompassing said small diameter shaft;

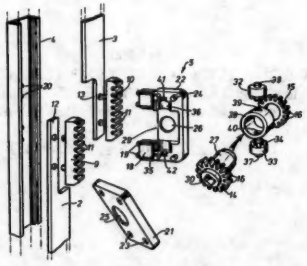
wherein said release bar is slideably trapped between a cover and a base, said cover is shorter than said release bar and disposed intermediate said release bar and said lock housing; said bar includes extended support members having apertures at their extended ends, said bell crank including two upright striker portions and an actuator portion and is journalled by apertures for pivotal movement about a pin shaft, said pin shaft being inserted within said apertures of said extended ends and said pivotal bell crank such that said bell crank can be pivoted by a force on said actuator portion to slide said release bar and release said lock bar means.

4,616,864

FASTENERS FOR DOORS, WINDOWS AND THE LIKE

Jack E. Douglas, Stratford-on-Avon, England, assignor to Hardware & Systems Patents Limited, London, England

Filed Oct. 18, 1984, Ser. No. 662,173
Claims priority, application United Kingdom, Oct. 22, 1983, 8328302
Int. Cl.[4] E05C *9/12*
U.S. Cl. 292—336.3 **12 Claims**



1. A fastener for a door, window and the like comprising first and second elongate bars mounted for displacement longitudinally thereof, a drive mechanism comprising a respective rack and pinion assembly for each of said bars of which the respective racks are provided on the bars and the respective pinions are mounted for rotation about a common axis, a rotatable actuator connected to said first pinion for effecting rotation of said first pinion in one sense, and means connecting said second pinion to said first pinion for effecting simultaneous rotation of said second pinion in the opposed sense whereby said bars are simultaneously displaced in opposite directions on rotation of said actuator to provide a fastening action.

4,616,865

SECURITY LOCK ASSEMBLY

Michael T. Mackle, St. Ives, Australia, assignor to Wormald International, Limited, New South Wales, Australia

Filed Aug. 28, 1984, Ser. No. 645,049
Int. Cl.[4] E05C *13/10*
U.S. Cl. 292—341.16 **10 Claims**

1. A security lock assembly comprising:

a movable lock bolt;

a striker unit which is adapted for mounting in a door jamb and which defines a cavity to receive said lock bolt;

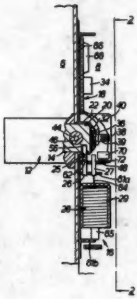
latch means mounted on said striker unit for movement to an operative position protruding into said cavity in which said latch means is engageable with said bolt therein to prevent its withdrawal from said cavity;

drive means to drive said latch means to said operative position;

a magnetized element in said lock bolt;

a magnetically operable switch mounted on said striker unit adjacent said bolt cavity, which switch is located near said

element so as to be responsive to said magnetized element, on receipt of said lock bolt in said cavity; and



circuit means between said drive means and said switch to activate said drive means upon operation of said switch.

4,616,866

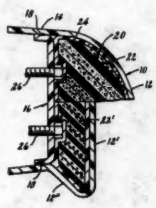
VEHICLE BUMPER

Norman S. Loren, Warren, and William E. Gordon, Sterling Heights, both of Mich., assignors to Michael Ladney, Jr., Sterling Heights, Mich.

Continuation-in-part of Ser. No. 568,215, Dec. 30, 1983, abandoned. This application Jun. 25, 1984, Ser. No. 624,202

Int. Cl.[4] B60R *19/08*

U.S. Cl. 293—120 **12 Claims**



1. A vehicle bumper, comprising:

a fascia having a front portion adapted to receive impact forces and upper and lower flanges extending rearwardly from said front portion;

a backing member positioned rearwardly of the front portion of the fascia and extending vertically relative to said upper and lower flanges, said member including means for mounting the bumper on the vehicle; and

a resiliently compressible plastic foam molded in situ in at least the volume bounded by the backing member and the fascia, said foam having an integral skin bonded to adjacent surfaces of the fascia and the backing member.

4,616,867

MEASURING SCOOP

John J. O'Hara, 3689 Karen Pkwy., Pontiac, Mich. 48054

Continuation of Ser. No. 319,452, Sep. 29, 1983, abandoned. This application Jun. 10, 1985, Ser. No. 742,658

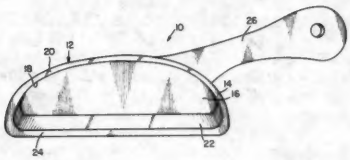
Int. Cl.[4] A47F *13/08*; G01F *19/00*

U.S. Cl. 294—55 **1 Claim**

1. A measuring scoop comprising:

a housing having a peripheral wall, an end wall, and an open end, thereby defining an open-ended chamber, said peripheral wall having an elongated, flat portion defining an elongated narrow edge along a corresponding portion of the open end, and an arcuate wall portion extending over said elongated, flat portion, the distance between a midpoint of said arcuate wall portion and said elongated flat portion being substantially less than the length of said flat portion whereby said open end of said housing is elongated having one flat side and one arcuate side,

an elongated handle integrally formed with said arcuate wall portion of said housing closely adjacent one end of said flat portion so that said handle is longitudinally aligned in a direction substantially parallel to said elongated edge



and substantially coplanar with said end wall, and spaced upwardly apart from said elongated flat portion, so that with said elongated flat portion lying on a flat surface, said handle is spaced upwardly from the surface by an amount sufficient so that with said handle grasped by a human hand, the hand is spaced upwardly from said surface

wherein the longitudinal length of said elongated flat portion is greater than the longitudinal length of said handle so that, with said flat portion resting on a support surface, said handle remains in a raised position.

4,616,868

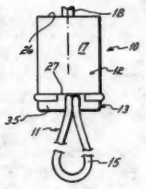
HANDLE WITH CARRYING STRAP

Toshio Okuda, Hirakata, Japan, assignor to 'Totes', Incorporated, Loveland, Ohio

Filed Jan. 24, 1985, Ser. No. 694,529

Int. Cl.[4] A45B *25/00*

U.S. Cl. 294—137 **8 Claims**



1. An umbrella handle comprising

a carrying strap having a connector loop and a hand loop, said connector and hand loops being defined from a single closed loop strap configuration,

a sleeve that defines an exterior peripheral surface which surrounds said handle's longitudinal axis, said sleeve's exterior surface being grippable by a user's hand during normal use of said handle,

a cap connectable with said sleeve, said cap defining an exterior end surface which traverses said handle's longitudinal axis, said cap's exterior surface not being grippable by a user's hand during normal use of said handle,

structure defining a peripheral groove that extends around the exterior surface of said sleeve, said peripheral groove being partially formed by said sleeve and partially formed by said cap, said carrying strap's connector loop being seated within said peripheral groove, and

two posts spaced one from the other within said peripheral groove, said posts cooperating to partially define a strap slot therebetween through which a double thickness of said hand loop extends into the handle's interior, each of

said posts also cooperating to partially define a guide slot spaced from said strap slot through which a single thickness of said connector loop extends into the handle's interior, said guide slot structure cooperating with said strap slot structure to define a tortuous path around which a portion of said strap's connector loop must pass, the juxtaposition of said strap's connector loop and said hand loop thereby being positioned internally of said handle.

4,616,869

AERODYNAMIC FAIRING FOR PASSENGER CARS AND UTILITY-TYPE MOTOR VEHICLES

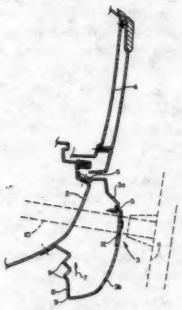
Bruno Sacco; Johann Tomforde, both of Sindelfingen; Joachim Paschke, Gechingen, and Harald Leschke, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 14, 1983, Ser. No. 561,231

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1982, 3246767

Int. Cl.⁴ B62D *35/02*

U.S. Cl. 296—1 S **18 Claims**



1. An aerodynamic fairing, made of plastic material, for outer laterally disposed longitudinally extending members of bodies for wheeled motor vehicles, which in conjunction with an outer wall of a respective outer member, forms a closed hollow body means, comprising an upper zone made of a plastic material which is comparatively form-rigid, and a lower zone having a lower portion depending below the outer wall which can be elastically deformed and an upper portion which is fastened to the upper zone, the closed hollow body being bounded by the outer wall and the upper and lower zones, and the lower zone including means for enabling a reduction in height of the fairing without the fairing being damaged.

4,616,870

MOBILE DISPLAY SYSTEM

Keith W. Halden, Owlwood Farm, Allerton Bywater, Castleford, West Yorks WF10 2AN, England

Filed Jun. 4, 1985, Ser. No. 741,157

Int. Cl.⁴ B60R *13/00*

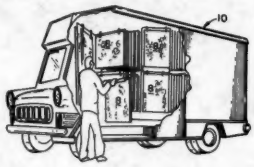
U.S. Cl. 296—21 **16 Claims**

1. A mobile display system for carpet samples and the like, comprising:

a vehicle having an interior space defining a mobile showroom for carpet samples and the like;

a framework having at least one elongated support member secured to the vehicle within the interior space;

a plurality of racks pivotally mounted in a row on the at least one elongated rack support member and adapted to hold samples of carpet and the like on both sides thereof, the racks being so closely spaced as to tend to randomly engage one another, the carpet samples and the like cushioning the engagement to reduce damage to the racks and noise during vehicle movement without damaging the carpet samples and the like; and,



rack restraining means affixed to the vehicle and adapted to be detachably engaged to the racks to prevent swinging during transport, whereby very large numbers of samples may be transported and displayed.

4,616,871

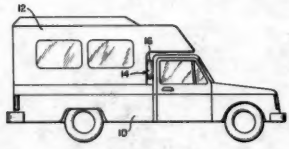
SNAP-IN WINDOW BOOT FOR TRUCK-CAMPER COMBINATIONS AND THE LIKE

Thomas L. Pettit, 21420 118th Ave. East, Graham, Wash. 98338

Filed Jul. 22, 1985, Ser. No. 757,258

Int. Cl.⁴ B60P *3/32*

U.S. Cl. 296—166 **8 Claims**



1. A sealing means or boot for use between adjacent window or passageway openings in the cab of a vehicle and a component mounted on th vehicle such as a camper, cap or canopy, said boot comprising: a tunnel made of relatively flexible material having an external circumference approximately equal the internal circumference of the passageway openings in which the boot is installed, said tunnel having a length somewhat greater than the spacing between the vehicle cab and component passageway openings, said tunnel terminating in opposed ends; and retention means, at each of said opposed ends of said tunnel for retaining said opposed ends behind the passageway openings, outside of the space between the passageway openings, each said retention means being substantially quadrilateral in configuration and having a circumference greater than that of the passageway opening behind which it is placed, at least one of said retention means including a first pair of opposed legs joined by a pair of opposed, inwardly compressible legs, each said compressible leg having slidably interfitted members spring urged to an expanded state, said slidably interfitted members being constructed and arranged to permit substantial relative movement of one of said first pair of opposed legs towards the other of said first pair of opposed legs, whereby said one retention means may be installed behind a passageway opening by grasping said first pair of legs and squeezing the same together, inserting said one retention means through a passageway opening, and releasing said one retention means whereupon said compressible legs expand and said one retention means assumes a circumference greater than that of the passageway opening through which it was inserted.

4,616,872
EARTH MOVING VEHICLE

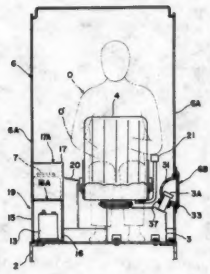
Takashima Akira; Masahiko Kobayashi; Hitoo Nasu; Yoshishiro Okida, all of Sakai, and Kazuhiko Tsuji, Izumi, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Mar. 14, 1985, Ser. No. 711,874

Claims priority, application Japan, Nov. 28, 1984, 59-181435[U]

Int. Cl.[4] B62D *33/06*

U.S. Cl. 296—190 2 Claims



1. An earth moving vehicle, comprising:

a moving device for running the earth moving vehicle;

a swivel deck including an upper surface having front, rear and two side portions, said swivel deck being rotatably connected to the moving device relative to a vertical axis extending through the moving device;

a motor section situated on the rear portion of the upper surface of the swivel deck, and

a driver's cabin situated on the entire upper surface of the swivel deck except the rear portion for the motor section, said driver's cabin including a front wall, a rear wall, first and second side walls, said first wall having a first opening at a lower portion thereof, a second opening adjacent to the first opening and a lid for covering the second opening, said second side wall having a third opening and a lid for covering the third opening, said all walls being arranged substantially perpendicularly to the swivel deck, a driver's seat situated in front of the rear wall between the first and second side walls, an interior cover situated inside the driver's cabin adjacent the first side wall so that a space surrounded by the interior cover can be accessible through the first opening, said interior cover having a top surface which is located under the driver's elbow when a driver is seated on the driver's seat, a console box situated between the interior cover and the driver's seat and having a top surface located below the top surface of the interior cover, a battery case situated inside the driver's cabin adjacent the first side wall next to the interior cover so that a space surrounded by the battery case is accessible through the second opening which is closable by the lid for the second opening, said battery case having a top surface lower than the top surface of the interior cover, a fuel tank situated under the driver's seat and having a refilling port situated adjacent to the third opening of the second side wall, and a partition element attached around the refilling port and connected to the second side wall around the third opening so that the refilling port communicates with atmosphere outside the driver's cabin, whereby interior of the driver's cabin can be effectively utilized.

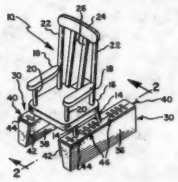
4,616,873
ROCKER SAFETY BOOT

Joseph G. Debo, 70 Puritan Rd., Tonawanda, N.Y. 14150

Filed Sep. 25, 1985, Ser. No. 779,818

Int. Cl.[4] A47C *3/02*

U.S. Cl. 297—272 6 Claims



1. A safety boot for freely enclosing each rocker of a rocking chair having front and rear legs respectively connecting the front and rear ends of each rocker to a seat, in order to prevent injury to human extremities caused by pinching beneath each rocker and the floor, while at the same time permitting the desired rocking motion, said boot comprising: an elongated bottom wall of greater width and length than each rocker and adapted to support each rocker; elongated front and rear end walls extending upwardly from the front and rear ends respectively of said bottom wall, and adapted to extend sufficiently above the highest rise of the front and rear ends respectively of each rocker, in order to enclose the same when so elevated; elongated outer and inner side walls of greater height and length than each rocker, connecting said end walls, extending upwardly from said bottom wall, and adapted to enclose each rocker and its connecting legs during rocking; and an elongated flexible cover connecting said end walls and said side walls and adapted to enclose each rocker and its connecting legs; said cover being split longitudinally into inner and outer sections to permit installation and removal of said boot, as well as to provide spacing for movement of the legs during rocking; and means for removably fastening the split cover sections together lengthwise above each rocker.

4,616,874
VEHICLE SEAT ASSEMBLY

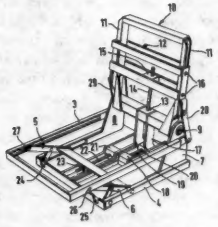
Helge Pietsch, Detmold; Manfred Rink, Bielefeld, and Christian Süss, Bad Salzuflen, all of Fed. Rep. of Germany, assignors to Gebr. Isringhausen, Lemgo, Fed. Rep. of Germany

Filed May 29, 1984, Ser. No. 615,045

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1983, 3320009

Int. Cl.[4] B60N *1/06*

U.S. Cl. 297—321 3 Claims



1. A seat assembly for a vehicle seat comprising:

(a) an underframe;

(b) a seat frame above said underframe;

(c) a pair of spaced support levers supporting the forward portion of said seat frame on said underframe so that the

forward portion of said seat frame is adjustably positionable in spaced relation above the forward portion of said underframe;

(d) a support frame pivotally mounted on the rear portion of said underframe so that it is pivotable toward and away from said seat frame about an axis located in the rear portion of said underframe;

(e) a backrest frame slidably mounted on said support frame so that it is movable thereon toward and away from said axis but so that it is adjustably securable with respect to said suport frame; and

(f) means for maintaining said backrest frame in adjusted position relative to said support frame;

(g) means pivotally suspending the rear portion of said seat frame from said backrest frame;

(h) whereby vertical movement of said backrest frame effects vertical movement of the rear portion of said seat frame.

4,616,875

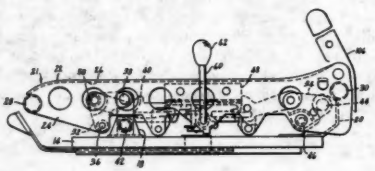
ADJUSTABLE SEAT CONSTRUCTION

Bob L. McFalls, Roseville, and William R. Tighe, Dearborn, both of Mich., assignors to Ferro Manufacturing Corporation, Southfield, Mich.

Filed Oct. 17, 1983, Ser. No. 542,458

Int. Cl.[4] A47C *3/20*; F16M *13/00*

U.S. Cl. 297—325 **4 Claims**



1. An adjustable seat assembly comprising a lower support, a rigid rectangular seat frame, front and rear bell crank levers pivotally connected between said support and the front and rear respectively of said frame, said bell crank levers being pivotal on said frame as a consequence of substantially vertical movement of the adjacent edge of said frame, an elongated longitudinally extending rack plate having a series of openings therein fixed to said frame, elongated longitudinally extending, longitudinally slotted front and rear pawls pivotally connected at one end to corresponding bell crank levers and having teeth at their other ends receivable in the openings in said rack plate, a manually operable control lever having an inwardly extending end pivotal on said frame to provide for pivotal movement of said control lever forwardly and rearwardly from an intermediate position in which both bell cranks are locked against pivotal movement, an operator fixed to said control lever having a lug thereon, front and rear actuators pivoted for independent movement on the inwardly extending end of said control lever engaging said lug, front and rear latch levers pivoted to said frame for independent movement about transverse axes by said actuators, said latch levers having projections thereon receivable in the slots in said pawls and operable to swing the toothed end of the corresponding pawl to disengage its teeth from the openings in said rack plate, the elongated slots in said pawls providing for longitudinal movement thereof on pivotal movement of the associated bell crank levers.

4,616,876

ROTATION ADJUSTING APPARATUS

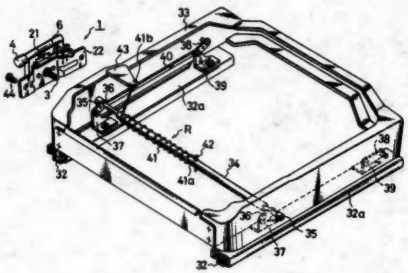
Hiroshi Suzuki; Masatatsu Kanai; Seishiro Saitoh, and Shigeru Kanai, all of Tokyo, Japan, assignors to Tachikawa Spring Co., Ltd., Tokyo, Japan

Filed Jul. 3, 1985, Ser. No. 752,079

Claims priority, application Japan, Aug. 31, 1984, 59-182144; Mar. 28, 1985, 60-64559

Int. Cl.[4] B60N *1/02*

U.S. Cl. 297—328 **6 Claims**



1. A rotation adjusting apparatus comprising;

(a) a base bracket fixed to a shaft to be driven;

(b) a fixed gear;

(c) a lock gear rotatably supported by said base bracket and engageable with said fixed gear;

(d) a guide bracket rotatably supported by said base bracket;

(e) a handle slidably supported by said base bracket;

(f) means for coupling said guide bracket to said lock gear; and

(g) means fixed to said handle and for rotating said guide bracket when said handle is slid relative to

said base bracket, said apparatus being so constructed that when said handle is slidably extended most outwardly from said base bracket, said guide bracket is rotated by said rotating means relative to said base bracket and said lock gear is also rotated through said coupling means so that the engagement between said lock gear and said fixed gear is released whereby said base bracket and hence said shaft can be rotatable by said handle.

4,616,877

CHAIR WITH BACK HEIGHT ADJUSTMENT

Mathew A. Slaats, and James E. Blesinger, both of Jasper, Ind., assignors to Kimball International, Inc., Jasper, Ind.

Filed May 9, 1985, Ser. No. 732,516

Int. Cl.[4] A47C *1/00*

U.S. Cl. 297—353 **21 Claims**

1. A chair comprising:

a base, a seat and a support column connected to one of said base and seat,

a carrier slidably connected to said column,

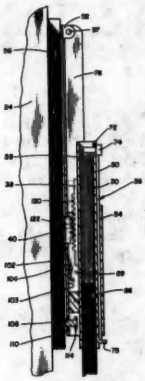
a back panel,

first pivot means secured to an upper portion of said back panel for pivotally connecting said panel to said carrier for limited rotation about a first pivot axis,

locking means comprising a first locking element on said back panel selectively engageable with a second locking element on said support column when the panel is rotated about the first pivot axis to a locked position to thereby lock the panel and carrier in a selected vertical position, said first and second lock elements disengaging when the panel is rotated about the first pivot axis to a release position wherein the panel and carrier can be moved vertically relative to said support column,

biasing means operatively associated with said panel for

yieldably urging said panel towards its lock position to cause engagement of said first and second lock elements, and



second pivot means for pivotally connecting said carrier to said support column for rotation about a second pivot axis, said second axis being located below the first axis and in proximity to said locking means.

4,616,878

FITTING FOR A SAFETY BELT FOR MOTOR VEHICLES

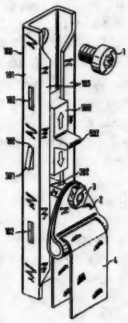
Artur Fohl, Schorndorf, Fed. Rep. of Germany, assignor to TRW Repa GmbH, Alfdorf, Fed. Rep. of Germany

Filed Aug. 3, 1984, Ser. No. 637,518

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1983, 3328258

Int. Cl.[4] B60R *21/10*

U.S. Cl. 297—483 19 Claims



1. An adjustable safety belt anchorage comprising a guiding rail adapted to be mounted in a motor vehicle, a carriage longitudinally slidable in first and second directions along said guiding rail, said guiding rail having longitudinally spaced locking openings, a locking member movably mounted on said carriage for selective engagement with said spaced locking openings, said carriage having support means for the safety belt, an actuator member movable relative to said carriage for a limited distance in the first and second directions, means for converting relative movement between said actuator member and said carriage in a selected one of the first and second directions into movement of said locking member away from one of said locking openings, and means interconnecting said actuator member and carriage for moving said carriage along said guiding rail in the selected one of the first and second directions in response to continued movement of said actuator member in the selected one of the first and second directions.

4,616,879

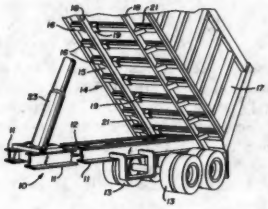
DUMP TRAILER WITH QUIET CUSHIONS

Howard Booher, P.O. Box 277, Randolph, Ohio 44265

Filed Mar. 21, 1984, Ser. No. 591,929

Int. Cl.[4] B60P *1/16*

U.S. Cl. 298—10 5 Claims



1. An improvement in a dump trailer, said dump trailer comprising a chassis having longitudinally extending beams with ground engaging wheels under one end and a dump body pivoted to said chassis, said dump body having cross frame members transversely thereof and transversly of said longitudinally extending beams, said cross frame members each having side walls, and means for elevating said dump body with respect to said chassis; the improvement comprising means for preventing direct contact of said cross frame members of said dump body with said longitudinally extending beams of said chassis, said means consisting of grooved means defined in said cross frame members side walls, and a plurality of resilient cushion members having flanges located thereon for engagement with said grooved means, a plurality of said cushion members being positioned on each of a plurality of said cross frame members of said dump body, each of said cushion members being located to be interposed between each of said plurality of cross frame members and corresponding ones of said longitudinally extending beams of said chassis when said dump body is positioned on said chassis whereby essentially all contact between said plurality of dump body cross frame members and said chassis longitudinally extending beams is prevented, said plurality of cross frame members of said dump body being of a known cross sectional configuration and each of said plurality of said resilient cushion members being formed in a cross sectional configuration substantially the same as the cross sectional configuration of said plurality of cross frame members and are distorted and placed on said plurality of cross frame members so as to be self-securing with respect thereto.

4,616,880

CONTINUOUS EXCAVATING MACHINE

Yasuo Nozaki, Hyogo; Yoshikazu Oishi, Kakogawa, and Takanori Koga, Akashi, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Dec. 21, 1982, Ser. No. 451,972

Claims priority, application Japan, Dec. 26, 1981, 56-212168

Int. Cl.[4] E02F *3/18;* E21C *35/20*

U.S. Cl. 299—39 3 Claims

1. A continuous excavator comprising a self-propelled main frame,

forwardly projecting booms pivotably supported on said frame for pivotal up and down movement,

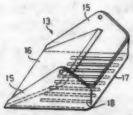
a self-rotated cutter drum supported on said booms and having a plurality of cutter bits on its outer periphery,

A scraper supported on said frame behind a lower portion of

said drum to collect excavated material dug by said cutter bits,

a first upwardly sloping conveyor supported on said frame and having its lower end positioned adjacent said scraper for conveying the material away from said scraper, and

a pivotable second conveyor supported on said frame below



the upper end of said first conveyor and pivotable both horizontally and in a vertical plane, to convey the material from said first conveyor out of said excavator, said scraper comprising a bottom plate having slits through its rearward portion, and a rearwardly and upwardly sloping plate above the forward portion of said bottom plate, for guiding the material to said first conveyor.

4,616,881

TRACTOR-TRAILER BRAKE SYSTEM INCLUDING A TRAILER BRAKE CONTROL VALVE

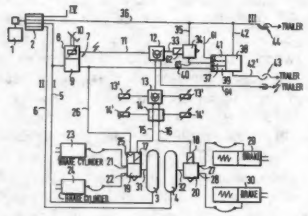
Egbert Müller, Eberdingen-Hochdorf; Ingolf Grauel, Vaihingen/Enz, and Werner Stumpe, Kornwestheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 415,301, Sep. 7, 1982, abandoned. This application Nov. 7, 1984, Ser. No. 669,740

Claims priority, application Fed. Rep. of Germany, May 21, 1982, 3219140

Int. Cl.[4] B60T *8/02, 13/26, 13/68, 13/74*

U.S. Cl. 303—7 **9 Claims**



1. A tractor-trailer compressed air brake system having a protective valve on said tractor for dividing compressed air from a compressed air supply source into four different compressed air circuits on said tractor and to said trailer, a dual-circuit brake control means on said tractor controlled by a foot-operated brake control pedal for operating a first and second service brake control circuit, a compressed air control valve on said tractor for controlling compressed air to said trailer, said compressed air control valve including at least two pressure control elements, one of said at least two pressure control elements controllable by said first service brake control circuit and another of said at least two pressure control elements controllable by said second service brake control circuit via said foot-operated dual circuit brake control means, one of said first and second service brake control circuits including an electrically responsive control circuit means for controlling one service brake control circuit and one control element of said control valve for the trailer.

4,616,882

BRAKE ARRANGEMENT FOR HYDRAULICALLY POWERED VEHICLES

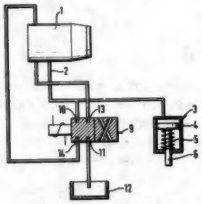
Alfredo Bueno, Sao Paulo-Sp, Brazil, assignor to Dynapac AB, Solna, Sweden

Filed Aug. 30, 1984, Ser. No. 645,928

Claims priority, application Sweden, Sep. 1, 1983, 8304730.8

Int. Cl.[4] B60T *11/28*

U.S. Cl. 303—68 **1 Claim**



1. A brake arrangement for hydraulically powered vehicles comprising:

hydraulic fluid tank means for supplying hydraulic fluid;

a hydraulic cylinder;

pump means for pumping said hydraulic fluid from said fluid tank means under pressure into said hydraulic cylinder;

first hydraulic circuit means for connecting said cylinder directly to said tank means;

spring means arranged in said cylinder;

a piston in operative contact with said spring means and slideably engaging said cylinder so as to be displaceable from a first position whereat said piston holds said spring means in a charged condition under the pressure of said hydraulic fluid to a second position under the force of said spring means in response to a loss in pressure of said fluid; and,

brake means for halting the vehicle, said brake means being operatively connected to said piston for movement from a relaxed position corresponding to said first position of said piston to a braking position corresponding to said second position of said piston;

second hydraulic circuit means for short-circuiting said pump means thereby reducing the hydraulic propellant force and yet enabling the same to continue to function; and,

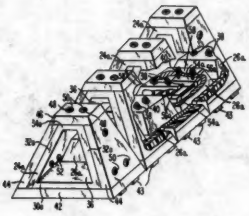
hydraulic switching valve means switchable from a deenergized condition to an energized condition; said valve means being connected into said first circuit means for opening the same to divert the fluid away from said hydraulic cylinder and into said tank means when switched into said energized condition thereby causing said brake to be moved into said braking position independently of any loss of pressure in said braking arrangement caused by leakage, said valve means also being connected into said second circuit means for opening the same when in said energized condition thereby short-circuiting said pump means by returning the fluid directly to the latter.

4,616,883

ENDLESS DRIVE SYSTEM

John W. Edwards, Brandon; Daniel R. Harper, and Quinton B. McNew, both of Fort Myers, all of Fla., assignors to Edwards, Harper, McNew and Company, Fort Myers, Fla.

Division of Ser. No. 607,067, May 4, 1984, Pat. No. 4,569,561, which is a continuation-in-part of Ser. No. 516,831, Jul. 25, 1983, abandoned. This application Oct. 18, 1985, Ser. No. 789,265
The portion of the term of this patent subsequent to Feb. 11, 2003, has been disclaimed.
Int. Cl.[4] B62D *55/12, 55/18*
U.S. Cl. 305—40 23 Claims



1. An endless drive system comprising:

a plurality of endless drive sections each including a substantially closed shoe portion having first and second side edges, first and second substantially closed side walls extending from the first and second side edges of the shoe portion and sloping inwardly therefrom toward the center of the endless drive section, and a central surface joining the first and second side walls to define therewith and with the shoe portion a drive section body; and

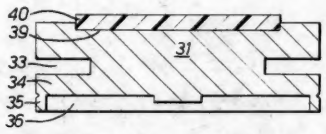
a like plurality of cable connector section, each including at least one cable member and means to attach one end of the cable connector section to a first one of the endless drive sections and the other end of the cable connector section a second one of the endless drive sections, such attachments being within the drive section bodies of the endless drive sections, to cause the plurality of cable connector sections to join the plurality of endless drive sections in a closed loop as an endless drive system.

4,616,884

STRUCTURAL BEARINGS

John C. Baker, Crewkerne, England, assignor to AEPLC, England

Filed Jan. 11, 1985, Ser. No. 690,764
Claims priority, application United Kingdom, Jan. 12, 1984, 8400773
Int. Cl.[4] F16C *29/02*
U.S. Cl. 384—7 6 Claims



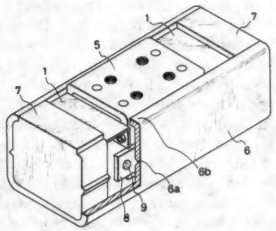
1. A structural bearing adapted to rest on a support surface and capable of deformation comprising a plate having a dependent peripheral support means for engaging the support surface and a load engaging bridge means for extending between and connecting said peripheral support means on opposite sides of the plate, said bridge means including deformation means adjacent said peripheral support means for deforming to permit said bridge to shift its planar relationship to the support surface when said bearing is subjected to a non-uniformly applied load resulting from the spacing between the top surface of the bridge and the support surface being different from one side of the plate to another whereby the load distribution over said support surface is redistributed to render it more uniform.

4,616,885

DUST-FREE ROLLING-CONTACT BEARING ASSEMBLY

Yoshiyuki Komiya, Kawasaki, Japan, assignor to Nippon Thompson Co., Ltd., Japan

Filed May 7, 1985, Ser. No. 731,682
Claims priority, application Japan, May 21, 1984, 59-73231[U]
Int. Cl.[4] F16C *29/08*
U.S. Cl. 384—15 5 Claims



1. A rolling-contact bearing assembly comprising:

a track rail elongated in shape and including a pair of side wall sections which are placed opposite to each other in parallel as spaced apart over a predetermined distance and a bottom section connecting the bottom ends of said side wall sections;

a pair of end blocks each fixedly attached to each end of said track rail, said end block covering the corresponding end of said track rail;

a moving table disposed substantially inside of said track rail as located between said pair of side wall sections;

a plurality of rolling members interposed between said table and said track rail thereby allowing said table to move along said track rail between said pair of end blocks; wherein said table includes a generally U-shaped cross section comprising a pair of side wall sections oppositely arranged in parallel and a top section connecting the top ends of the pair of side wall sections, whereby an outer guide groove is formed in the inner surface of each of the side wall sections of said track rail and an inner guide groove is formed in the outer surface of each of the side wall sections of said table, said inner and outer guide grooves being oppositely located to define a guide passage in which said rolling members are located; and

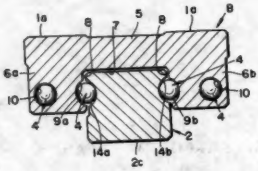
shielding means for uniformly shielding the space between said pair of side wall sections of said track rail to completely enclose the rolling members as said table moves along said track rail, in cooperation with the rail, end blocks, and table.

4,616,886

LINEAR SLIDE BEARING AND LINEAR SLIDE TABLE UNIT EMPLOYING THE SAME

Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-Ku, Tokyo, Japan

Continuation of Ser. No. 602,839, Apr. 23, 1984, abandoned. This application Dec. 26, 1985, Ser. No. 815,285
Claims priority, application Japan, May 2, 1983, 58-76233; May 16, 1983, 58-84020
Int. Cl.[4] F16C *29/06*
U.S. Cl. 384—45 4 Claims



1. A linear slide bearing adapted to slidably mount a mounting table on a bed comprising:

a main body of substantially inverted U-shaped cross-section having a horizontal portion and a pair of sleeve portions downwardly extending from both ends of said horizontal portion and defining therebetween a cavity on the lower side of said main body, each sleeve having a raceway groove of substantially semicircular cross-section formed in its inner surface along the longitudinal direction thereof, and each sleeve further having a recirculating ball bore longitudinally extending therethrough;

a track shaft having its upper part fitted in said cavity in said main body with a predetermined clearance therebetween, said track shaft being provded, in each of the side surfaces facing the inner surfaces of both sleeve portions of said main body, with a raceway groove of substantially semicircular cross-section extending in the longitudinal direction of said track shaft while confronting the corresponding one of said raceway grooves formed in the inner surfaces of said sleeve portions to constitute a loaded ball region;

a pair of covers adapted to be attached to both longitudinal ends of said main body, each cover being provided in its inner surface with guide grooves for providing communication between said recirculating ball bores and loaded ball regions to constitute endless tracks, respectively;

two rows of balls disposed between the opposed raceway grooves in the sleeve inner surfaces and the track shaft side surfaces so as to be recirculated through said endless tracks for bearing loads acting in all directions including lateral and vertical directions between said main body and said track shaft;

said horizontal portion of aaid main body having at its top a mounting surface inclined in either direction with respect to a mounting surface constituted by the bottom surface of said track shaft;

each of said raceway grooves formed in said main body and said track shaft being constituted by a circular arch groove having an inner surface with a curvature radius slightly larger than that of said balls such as to provide two-point contact between said balls and said raceway grooves; and

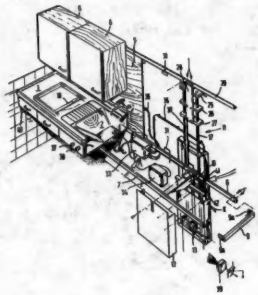
said main body being adapted to receive bolt means for securing said main body to said mounting table such that tightening of said bolt means applies a twisting force to said main body because of said inclined mounting surface to thereby apply a preload between said balls and said raceway grooves.

4,616,887

ADJUSTABLE WORK TOP

Dirk J. Oudman, Assen, Netherlands, assignor to Wigboma B.V., Netherlands

Filed Apr. 23, 1984, Ser. No. 603,112
Int. Cl.[4] A47B *57/06*
U.S. Cl. 312—140.1 15 Claims



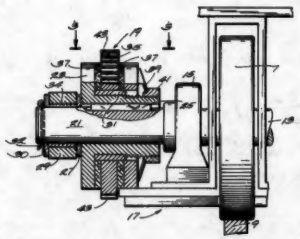
1. An adjustable work top attachable to a wall, in particular suitable for a kitchen, including means for attaching said work top to said wall and means for vertically adjusting said work top; characterized in that said means for vertically adjusting said work top include at least one electric motor-driven lifting device attachable vertically to said wall, which lifting device is provided with a horizontally extending carrier arm for carrying said work top and attachment members for mounting said carrier arm in cantilever fashion, which lifting device further includes a vertically mounted, telescoping assembly adjustable by means of the electric motor, said assembly having a member which is extensible and retractable relative to a stationary guide tube, said member comprising at least one substanitally horizontally extending yoke to which said carrier arm for said work top can be attached, said adjustable work top further including an electric control device for controlling said electric motor.

4,616,888

SAFETY BRAKE FOR MOBILE STORAGE APPARATUS

Robert J. Peterman, Hartland, Wis., assignor to Spacesaver Corporation, Fort Atkinson, Wis.

Filed Sep. 12, 1984, Ser. No. 649,692
Int. Cl.[4] A47B *53/02*
U.S. Cl. 312—201 4 Claims



1. A brake for smoothly stopping a bidirectional rotating shaft journaled in a frame comprising:

a. a carrier having a flange and a threaded hub mounted to the shaft for rotation therewith;

b. a cylindrical plate carried by the carrier hub and having at least one notch on the periphery thereof;

c. a pair of friction disks carried by the carrier hub, one disk being disposed on either side of the plate;
d. resilient biasing means for axially forcing the friction disks and plate against the carrier flange to cause the plate to rotate with the carrier;
e. a nut threaded onto the carrier threaded hub for producing an adjustable axial force on the friction disks and plate against the carrier flange;
f. lever means for preventing rotation of the plate in both directions;
g. an electric solenoid having a plunger connected to the lever means for operating the lever means in one direction to engage the lever means with the plate notch; and
h. spring means for operating the lever means in the opposite direction as the solenoid to disengage the lever means from the plate notch,

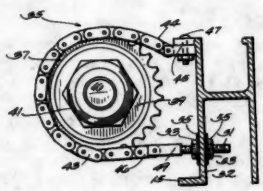
so that the kenetic energy associated with the rotating shaft is dissipated as heat between the friction disks and the non-rotating plate when the lever tooth is engaged in the plate notch.

4,616,889

ANTI-ROLL BRAKE FOR MOBILE STORAGE SYSTEM

Robert J. Peterman, Hartland, Wis., assignor to Spacesaver Corporation, Fort Atkinson, Wis.

Filed Sep. 14, 1984, Ser. No. 650,270
Int. Cl.[4] A47B *87/00*
U.S. Cl. 312—201 **4 Claims**



1. In combination with a mobile storage system having at least one movable storage carriage having a frame; rails embedded in a building floor; at least one first axle journaled in the frame; a plurality of wheels mounted to the first axle for moving the carriage along the rails; and drive means for transmitting power from a power source to move the carriage along the rails,

the improvement comprising:

a. a second axle journaled for rotation in the frame;
b. at least two wheels mounted to the second axle for supporting the second axle on the rails;
c. shaft means coupled to the second axle for rotating in conjuntion with the second axle;
d. a pair of friction discs mounted on the shaft means for rotation therewith;
e. plate means interposed between the friction discs and stationarily fastened to the frame and having opposed faces for mating with the friction discs; and
f. adjustment means for producing a predetermined force between mating faces of the friction discs and the plate means,

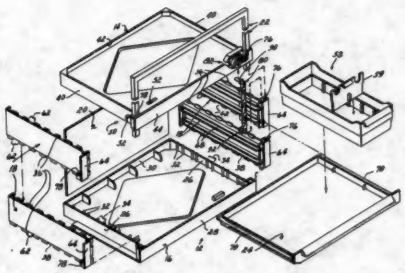
so that a friction force is produced at the faces between the rotating friction discs and the stationary plate means when the shaft means tends to rotate and a portion of the power applied to move the carriage is expended to overcome the friction force between the friction discs and plate means while the carriage is moving and the friction force between the friction discs and plate means prevents unpowered rolling of the carriage at all times the power is not applied.

4,616,890

MEDICATION CARTS AND CASSETTES

Jerome M. Romick, 170 N. Drexel Ave., Columbus, Ohio 43209

Filed Jan. 14, 1985, Ser. No. 691,272
Int. Cl.[4] A47B *47/00*
U.S. Cl. 312—257 R **10 Claims**



1. A medication cassette for use in a medication cart comprising

top, bottom, a plurality of side, and back panels,
connecting means on said side panels and said top and bottom panel which cooperate to position the side panels with respect to said top and bottom panels,
said connecting means including a plurality of interlock tabs on said side panels adapted to cooperate with interlock tabs on other side panels whereby said side panels may be stacked on top of each other to provide a single planar wall surface, said interlock tabs extending above and below each side panel and spaced apart a distance slightly greater than the width of a interlock tab,
said connecting means on said top and bottom panels including ribs that define channels which receive interlock tabs on said side panels,
a U-shaped frame adapted to engage said side, top and bottom panels to hold said side, top and bottom panels rigidly together,
engagement means on said top, bottom and side panels for receiving said channel frame means,
means for securing said back panel with respect to said bottom, top and side panels, and
a medication receptacle adapted to be inserted in said cassette.

4,616,891

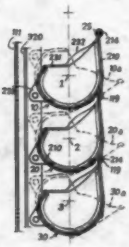
STORAGE CABINET WITH MULTIPLE STORAGE COMPARTMENTS

Eric Jantzen, 39 bis, rue Greneta, 75002 Paris, France

Filed Jun. 18, 1984, Ser. No. 621,470
Claims priority, application France, Jun. 20, 1983, 83 10167
Int. Cl.[4] A47B *88/02*
U.S. Cl. 312—328 **14 Claims**

1. A storage cabinet with multiple storage compartments comprising a support frame holding a plurality of storage compartments, said storage compartments are distributed in at least two superposed rows, each of said storage compartments is adapted to pivot about parallel horizontal axes mounted in the support frame, each of said storage compartments is shaped as a trough having two lateral end walls and a bottom wall, said bottom wall is defined by a portion of cylinder and has a first rear part, a second main part, and a third front part, said third front part having a free end, said bottom wall having an external side and an internal side, each of said storage compartments is adapted to present a first closed position and a second open position, each of said storage compartments is provided with a tongue member, said tongue member is attached to said external side of said bottom wall and extends outwardly sub-

stantially perpendicular to said bottom wall, said tongue member is adapted to come into a position adjacent to the free rear end of the first rear part of the bottom wall of a lower adjacent storage compartment when said storage compartments are in said first closed position, said external side of said bottom wall



is adapted to come into a position adjacent to the free end of the third front part of a lower adjacent storage compartment when said storage compartments are in said first closed position whereby each of said storage compartments is entirely closed.

4,616,892

PLASTIC DRAWER

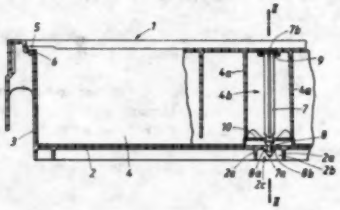
Siegfried Schleicher, Eferding, Austria, assignor to Ernst Stadelmann Gesellschaft m.b.H., Eferding, Austria

Filed Feb. 27, 1985, Ser. No. 705,990

Claims priority, application European Pat. Off., May 7, 1984, 84890080.9

Int. Cl.[4] A47B *88/00*

U.S. Cl. 312—330 R **11 Claims**



1. In a plastic drawer comprising a bottom, two longitudinal side walls and at least one vertical transverse partition detachably connected to and supported by said side walls,

the improvement residing in the provision of tension-resisting anchoring means connecting said bottom at said transverse partition and resisting a separation of said bottom from said partition, said means having a locking portion disposed under said bottom.

4,616,893

SURFACE MOUNT, MINIATURE, BUSSING CONNECTOR

Steven Feldman, Seminole, Fla., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 25, 1984, Ser. No. 603,802

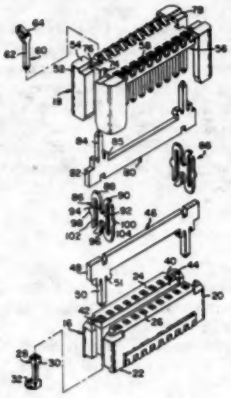
Int. Cl.[4] H01R *9/09*

U.S. Cl. 339—14 R **15 Claims**

1. A surface mount, miniature, bussing connector for mounting on a printed circuit board, comprising:

mutually mating plug and receptacle members each having a housing of insulative material defining a mating face, the plug and receptacle members being connectable on mutually mating faces, and an oppositely-directed surface mounting face with a plurality of terminal passages extending between said faces, each said housing having an elongated bus bar receiving groove extending longitudinally along the respective mating face and with at least one leg passage connecting said groove to said surface mounting face;

a pluality of compliant electrical terminals each mounted in a respective terminal passage of a respective one of said



housing, each terminal having a mating portion directed towards said mating face and a compliant solder tail extending from said surface mounting face for being soldered to the circuit board; and

a bus bar affixed in each said connector housing groove, each said bus bar being an elongated member of rigid conductive material having at least one depending leg which extends through said leg passage beyond the surface mounting face of the respective connector to engage in a bore in said circuit board.

4,616,894

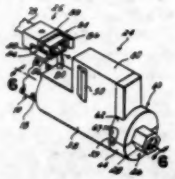
ELECTRICAL CONNECTOR FOR HOT MELT HOSE UNIT AND GUN

Robert G. Baker, Buford, Ga., assignor to Nordson Corporation, Amherst, Ohio

Filed Jan. 14, 1985, Ser. No. 691,074

Int. Cl.[4] H01R *4/64*

U.S. Cl. 339—15 **2 Claims**



1. For use in a system where molten material is delivered from a bulk source to a hot melt applicator through a hose, said hose having an end remote from said bulk source of material terminating in an outboard end connectable to the applicator by a nipple, said nipple having a hex nut thereon, and carrying along at least a portion of its length wires connected at one end to a source of electrical power and, at the said remote end, passing radially from the side of the hose and terminating in

electrical leads, an electrical connector for connecting the hot melt applicator to the source of electrical power through said wires comprising:

a one-piece molded plastic cuff having a through opening of a size such that said cuff can be slid on said remote end of said hose,

a plug block housing integral with said cuff including an integral plug block having a plurality of through openings for receiving and retaining said electrical leads, said leads being adapted to be inserted therein in a direction from the outboard end of said hose generally along the long axis of the hose, and a plug block cavity through which said wires terminating in said leads can pass, said plug block cavity being adapted to be disposed at the outboard end of said hose when said connector is mounted on said remote end of said hose,

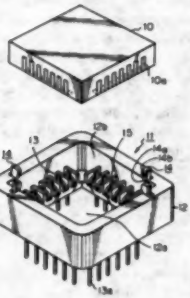
said cuff and housing having a peripheral groove about said plug block cavity and said cuff through opening and a pair of diametrically opposed ears across said groove,

an end cover covering said plug block cavity, said end cover including two portions adapted to mate and be secured together, each said end cover portion including a peripheral flange adapted to slide in said groove and be retained therein, each said peripheral flange having a pair of opposed cutouts such that when said portions are mated said cutouts define a slot capturing said ears to prevent rotation of said cuff and integral housing with respect to said end cover, each said end cover portion further including a Y-shaped slot having a pair of flats adapted to engage the flats on said hex nut to prevent rotation of said end cover and in turn said cuff and integral housing with respect to said hose.

4,616,895
INTEGRATED CIRCUIT SOCKET

Tsutomu Yoshizaki, Yokosuka, and Toshimasa Ishii, Yokohama, both of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 534,213, Sep. 20, 1983, abandoned. This application Sep. 9, 1985, Ser. No. 774,182
Claims priority, application Japan, Sep. 29, 1982, 57-168276
Int. Cl.[4] H01R *13/627*
U.S. Cl. 339—17 CF **6 Claims**



1. An IC socket for an IC device such as a quadrilateral-shaped leadless chip carrier having a bottom surface, and a plurality of electrodes formed on the bottom surface, said IC socket comprising:

a box-shaped housing of dielectric material opening at an upper side thereof and having a quadrilateral-shaped recess for receiving said IC device and a bottom;

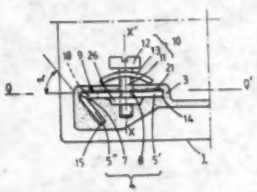
a plurality of contacts for contacting with said electrodes of said IC device within said recess, each of said contacts comprising a springy conductive member and being disposed in the bottom of said housing so as to contact with the electrodes formed on the bottom surface of said IC device; and

two pairs of pressing members for holding said IC device within said recess, each pressing member being formed as one body integral with said housing and comprising a springy member extending vertically in said recess with an inwardly projecting rounded projection formed at a top end of said springy member for pressing said IC device, said two pairs of pressing members being arranged at the sides of said socket at two diagonally opposed corners of said recess in such a manner that a pressing member of each pair engages with a different side edge of said IC device, at each of two diagonally opposed corners, while the other two diagonally opposed corners of said recess and the sides adjacent thereto are not provided with any pressing members whereby the edges of said IC device thereat are accessible for withdrawal of said IC device from said upper side against force exerted by said pressing members.

4,616,896
CONNECTING TERMINAL FOR PRINTED CIRCUIT BOARD

Gabriel R. J. Martin, Houilles, and Jean-Marie J. G. Riquier, Villepreux, both of France, assignors to La Telemecanique Electrique, France

Continuation of Ser. No. 472,507, Mar. 7, 1983, abandoned. This application Apr. 15, 1985, Ser. No. 722,431
Claims priority, application France, Mar. 5, 1982, 82 03678
Int. Cl.[4] H05K *1/00*
U.S. Cl. 339—17 C **3 Claims**



1. In a circuit board assembly which includes a dielectric board having a conducting layer forming electrical circuitry disposed on one side thereof and first, second and third metallized openings bored through the said dielectric board, a terminal for connecting conductors to said electrical circuitry, said terminal comprising, within the contour of a single piece capable of being cut from a sheet of metal blank:

i—a thin flat metal plate with first and second surface portions joining along a folding line with a predetermined angle between said first and second surface portions, said plate having a contact face, an edge surface contained in a plane substantially at right angles to the folding line, and, projecting from said edge surface in the planes of the respective surface portions, first, second and third substantially rigid conductive lugs extending substantially at right angles to the plane of the edge surface, the first and second lugs extending from the first surface portion with the second lug substantially nearer from the folding line than the first lug and the third lug extending from the second surface portion and being located substantially farther from the folding line than the second lug; said first, second and third conductive lugs being respectively inserted in the said first, second and third openings with the said edge surface being soldered to said conductive layer of the dielectric board;

ii—a threaded hole bored through the first surface portion of the metal plate substantially at right angles thereto and a clamping screw screwing into said hole;

iii—said screw having a head and a threaded body and a

convex profiled drilled strap mounted about said threaded body, said strap having an inner face which cooperates with said contact face for defining a space adapted to receive said conductors;

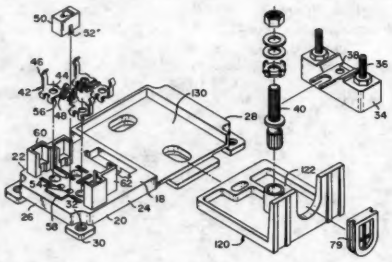
iv. the convex-profiled strap is substantially rectangular and has an edge in close proximity to the said edge surface of the first surface portion of the plate.

4,616,897

NETWORK INTERFACE DEVICE

Frank P. Dola, Hudson, Fla., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 499,659, May 31, 1983, Pat. No. 4,500,158. This application Dec. 13, 1984, Ser. No. 681,400
The portion of the term of this patent subsequent to Feb. 19, 2002, has been disclaimed.
Int. Cl.[4] H01R *13/514*
U.S. Cl. 339—122 R 9 Claims



1. A network interface device for terminating network telephone wiring at a subscriber's premises and for connecting the subscriber's wiring to the network, which device comprises:

a base having a first surface, means for mounting said base to a fixed surface, said base carrying on said first surface a telephone jack having a plurality of spring contacts therein and a like plurality of first terminals for connecting to said network telephone wiring, said spring contacts being electrically connected to like ones of said first terminals, a lightning arrester recess, and a removable insert;

a cover having a first surface, an opposed second surface, and means for mounting said cover to said base so that said second surface of said cover faces said first surface of said base, said cover having a plurality of apertures therethrough between said first and second surface thereof which provide access to said first terminals and said jack, said cover defining a cavity over said lightning arrester recess; and

a plug member having a first surface, an opposed second surface, and means for mounting said plug member to said cover so that said second surface of said plug member faces said first surface of said cover, said plug member carrying on said second surface a plurality of second terminals for connecting to said subscriber's wiring and arranged for mating to said first terminals through said apertures when said cover is mounted to said base and said plug member is mounted to said cover,

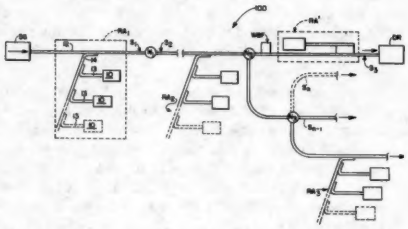
said recess being profiled to receive a first large lightning arrester when said insert is removed, and said recess being profiled to receive said insert, said insert being profiled to receive a second smaller lightning arrester.

4,616,898

OPTICAL COMMUNICATION SYSTEMS USING RAMAN REPEATERS AND COMPONENTS THEREFOR

John W. Hicks, Jr., Northborough, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 403,759, Jul. 30, 1982, abandoned, which is a continuation-in-part of Ser. No. 135,798, Mar. 31, 1980, Pat. No. 4,342,499. This application Sep. 28, 1983, Ser. No. 536,655
Int. Cl.[4] G02B *6/42, 6/26, 6/28*
U.S. Cl. 350—96.15 97 Claims



1. An optical fiber communication system, said system comprising:

an optical fiber transmission line including a core fabricated of a given material;

means, coupled to said optical fiber transmission line, for introducing a plurality of information-bearing optical signals thereonto for transmission therealong, each of said information-bearing optical signals being carried in a distinct channel of predetermined wavelength; and

means coupled to said optical fiber transmission line at a predetermined location, downline of said means for introducing information-bearing optical signals thereonto, for effecting collective optical amplification of all of said information-bearing optical signals, said optical amplification effecting means comprising means for introducing optical energy into said optical fiber transmission line at a plurality of preselected wavelengths relative to the wavelengths of said information-bearing optical signals to collectively amplify all of said information-bearing optical signals by stimulated Raman scattering, said plurality of said preselected wavelengths of said optical energy including an initial wavelength and other wavelengths separated from each other and said initial wavelength wherein adjacent wavelengths thereof are separated in wavenumber by an amount sufficient to minimize the effects of any Brillouin backscattering tending to interfere with said information-bearing optical signals.

4,616,899

METHODS OF AND APPARATUS FOR COUPLING AN OPTOELECTRONIC COMPONENT TO AN OPTICAL FIBER

John D. Schlafer, Wayland, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Aug. 31, 1984, Ser. No. 645,980
Int. Cl.[4] G02B *6/32*
U.S. Cl. 350—96.18 1 Claim

1. A method of coupling an optoelectronic component to an optical fiber comprising

(a) affixing said optoelectronic component to header;

(b) enclosing said component affixed header, to maintain said component in a fixed environment, while providing a window therewith for optically exposing said component;

(c) positioning a first body of optical quality transparent plastic having an optical axis and having

(1) a reference surface, and

(2) a lens on said optical axis having a convex surface

molded into said body, recessed inward from said reference surface,

said first body being positioned with respect to said component so that said

component is approximately one focal length away from said lens surface and approximately along said optical axis,

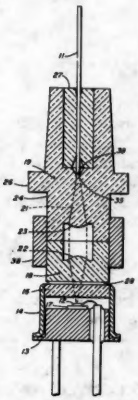
(d) positioning an alignment body of optical quality transparent plastic having an optical axis and having

(1) a reference surface,

(2) a lens on said optical axis of said alignment body having a convex surface molded into said alignment body, recessed inward from said reference surface of said alignment body, and

(3) a viewing plane surface, perpendicular to said optical axis of said alignment body, oriented approximately one focal length from said convex surface of said alignment body, said viewing plane surface having an alignment mark centered on said optical axis of said alignment body and oriented one focal length from said convex lens surface of said alignment body,

said alignment body and said first body being so positioned that their reference surfaces engage each other and so that their optical axes are co-aligned;



(e) aligning said first body with respect to said component so that an image of said component, formed by said lenses of said first body and said alignment body, is focused on the center of said alignment mark;

(f) affixing said aligned first body to said header;

(g) removing said alignment body from said first body; and

(h) positioning an optical fiber connector body molded of optical quality transparent plastic having an optical axis and having

(1) a reference surface,

(2) a lens on said optical axis of said connector body having a convex surface molded into said connector body, recessed inward from said reference surface of said connector body, and

(3) means for mating said optical fiber with said connector body along said optical axis thereof one focal length from said lens surface of said connector body;

so that said connector body and said first body are oriented with their reference surfaces engaged with each other, and with their optical axes co-aligned.

4,616,900

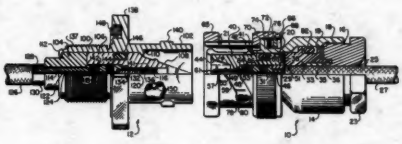
COAXIAL UNDERWATER ELECTRO-OPTICAL CONNECTOR

James L. Cairns, Mims, Fla., assignor to Lockheed Corporation, Burbank, Calif.

Filed Apr. 2, 1984, Ser. No. 595,686

Int. Cl.[4] G02B 6/42

U.S. Cl. 350—96.20 **23 Claims**



1. An underwater electro-optical connector, comprising:

a male unit with an open end;

a first electrically-conductive member in the open end, including bore means for receiving an electrical conductor, means for connecting to an optical conductor, and a forward tip;

first optically transmissive means adjacent said male unit bore means for conducting optical signals to and from said bore means and including a collimating leans in said forward tip;

a female unit for detachably fitting to said male unit open end;

a second electrically-conductive member in said female unit for connecting to said first conductive member when said female unit fits into said male unit and including bore means for receiving another optical conductor and means for connecting to another electrical conductor;

second optically transmissive means adjacent said female conductive member bore means for conducting optical signals to and from said bore means; and

alignment means in said male and female units for aligning said first and second optically transmissive means and for forming a watertight chamber when said male and female units are fitted together, said chamber containing said first and second conductive members and said first and second optically transmissive means.

4,616,901

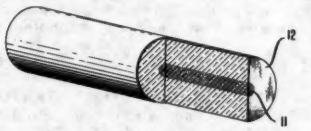
DOPED OPTICAL FIBER

John B. MacChesney, Lebanon; Jay R. Simpson, Fanwood, and Kenneth L. Walker, New Providence, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 367,091, Apr. 9, 1982, abandoned. This application Aug. 31, 1983, Ser. No. 527,970

Int. Cl.[4] G02B 6/00

U.S. Cl. 350—96.34 **10 Claims**



1. An optical fiber comprising at least 80% by weight silica, at least some of the silica being doped silica,

characterized in that

the doped silica comprises more than 5 mole percent alumina or zirconia and also comprises an effective amount of at least one phosphorus oxide for preventing devitrification of the doped silica during fiber manufacture.

4,616,902

COMPOSITE FILTER, OBSERVATION SYSTEM AND FILAMENTARY DISPLAY DEVICE

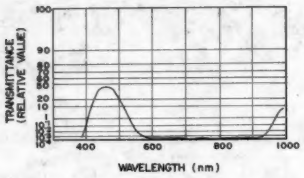
Kiyoshi Nagai, 228-91, Sachigawa, Oomiya-shi, Japan

Filed Jul. 10, 1984, Ser. No. 629,317

Claims priority, application Japan, Jul. 12, 1983, 58-126576; Jul. 12, 1983, 58-107934[U]; Jul. 12, 1983, 58-107935[U]

Int. Cl.[4] G02B *5/22*

U.S. Cl. 350—316 9 Claims



1. A composite filter (i) which transmits starlight radiation having a wavelength of 400 up to but not including 600 nm and (ii) does not transmit radiation having a wavelength of 600 to 900 nm comprising at least one organic film filter and at least one glass filter, in which said organic film filter absorbs light radiation having a wavelength of 600–700 nm and said glass filter comprises a glass plate colored with a cobalt-containing salt which absorbs light radiation having a wavelength of 700–900 nm.

4,616,903

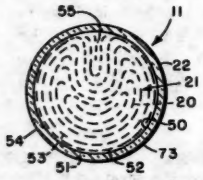
ENCAPSULATED LIQUID CRYSTAL AND METHOD

James L. Fergason, Kent, Ohio, assignor to Manchester R & D Partnership, Pepper Pike, Ohio

Continuation-in-part of Ser. No. 302,780, Sep. 16, 1981, Pat. No. 4,435,047. This application Mar. 21, 1983, Ser. No. 477,242

Int. Cl.[4] G02F *1/13;* C09K *19/52, 19/00*

U.S. Cl. 350—334 94 Claims



1. A billboard display comprising a liquid crystal apparatus, including operationally nematic liquid crystal material and containment means having a curvilinear surface for inducing a generally non-parallel alignment of said liquid crystal material which in response to such alignment at least one of scatters and absorbs light and which in response to a prescribed input reduces the amount of such scattering or absorption.

4,616,904

ULTRAVIOLET BEAM CONCENTRATOR

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed Nov. 15, 1984, Ser. No. 671,715

Int. Cl.[4] G02B *13/18, 17/00*

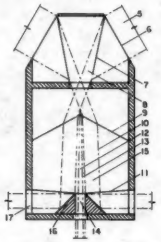
U.S. Cl. 350—432 1 Claim

1. An ultraviolet beam concentrator L-TR-RT:CUV comprising in general an upper component lens RT which receives and refracts a convergent conical incipient beam of diffused sunlight to form a convergent-divergent conical concentrated beam, a middle component lens TR which receives and refracts said concentrated beam to form a spectral beam, and a conical mirror L which emits the ultraviolet portion of said spectral beam through a conical aperture and which reflects laterally the remaining portion of said spectral beam, and comprising in particular;

an upper component lens RT (1) having a convex conical section (6) which receives and transmits a convergent conical incipient beam (5) of diffused sunlight,

said upper component lens RT having a concave conical section (7) which refracts said incipient beam to form a convergent-divergent conical concentrated beam (8),

a lower component lens TR (2) mounted below said upper component lens RT,



said lower component lens TR having a convex conical section (9) which refracts said concentrated beam to form a spectral beam (10),

said lower component lens TR having a convex conical section (11) which emits said spectral beam, and

a mirror L (3) mounted below said lower component lens TR,

said mirror L having a conical aperture (14) which emits the ultraviolet portion (12) and violet portion (13) of said spectral beam,

said mirror L having a convex conical reflective section (16) which reflects the remaining visible portion (15) of said spectral beam laterally through a circular slot (17) in the casing of the ultraviolet beam concentrator.

4,616,905

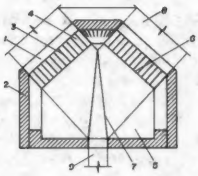
LOUVERED CONVERGENT CONICAL LENS

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed Aug. 20, 1984, Ser. No. 642,241

Int. Cl.[4] G02B *3/02*

U.S. Cl. 350—432 1 Claim



1. A louvered convergent conical lens comprising in general conical louvers mounted on the convex conical section of a conical lens as means of admitting a diffused incipient convergent conical beam of sunlight to the lens section and intercepting non-convergent sunlight, and comprising in particular;

conical lens RT (5) having a convex conical section (6) which receives and transmits said convergent conical incipient beam (8) of diffused sunlight, and having a concave conical section (7) which refracts said incipient beam (8), forming a concentrated circular whole beam (9)

which is emitted parallel to the vertical optic axis of the lens,

said conical louvers (3) comprising a series of thirteen conical louvers with parallel walls and graduated diameters, mounted adjacent to and perpendicular to the convex conical section (6) of conical lens RT (5), each conical louver (3) having twenty-four slots (10) occupying radial planes separated by angles of 15°, and

radial fin louvers (4) comprising twenty-four fins occupying radial planes separated by angles of 15° and meshed with the slots (10) of conical louvers (3), and

conical glass cover (1) mounted outside and adjacent to conical louvers (3) and radial fin louvers (4).

4,616,906

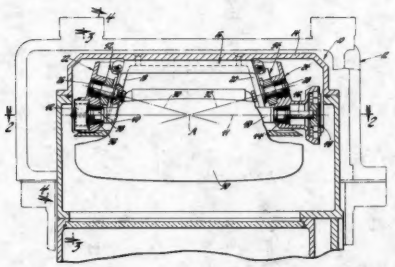
ADJUSTMENT MECHANISM

David C. Schweitzer, Santa Barbara, Calif., assignor to General Motor Corporation, Detroit, Mich.

Continuation of Ser. No. 538,583, Oct. 3, 1983, abandoned. This application Sep. 23, 1985, Ser. No. 778,843

Int. Cl.⁴ G02B *7/18*

U.S. Cl. 350—486 **8 Claims**



1. A mechanism for supporting a device and providing adjustable movement thereof about a pair of substantially perpendicular pivot axes, said mechanism including a yoke having a pair of laterally spaced legs, said legs supporting a pair of swing arms for pivotal movement about a pair of inclined axes, bearing means mounted in each of said swing arms for supporting said device for pivotal movement about one of said pivot axes, and means connecting said swing arms to each other for providing synchronous movement of said swing arms in opposite directions about said inclined axes so as to rotate said device and provide adjustable movement thereof about the other of said pivot axes.

4,616,907

ZOOMING MECHANISM FOR COMPACT BINOCULARS

Masakazu Nakamura, Tokyo, Japan, assignor to Enshu Kogaku Seiki Company Limited, Japan

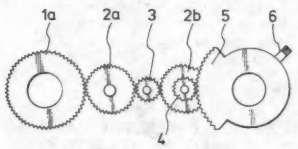
Filed Apr. 11, 1985, Ser. No. 722,263

Claims priority, application Japan, Apr. 13, 1984, 59-54266[U]

Int. Cl.⁴ G02B *7/02*

U.S. Cl. 350—552 **5 Claims**

1. A zooming mechanism for binoculars having right and left eye lenses pivotally connected to each other about a machine shaft axis for adjusting a width between light beams passing through the eye lenses, and a pair of magnification adjustment elements engaged with the eye lenses for adjusting the magnification thereof, comprising spaced apart right and left ring gears mounted for concentric rotation about respective light beams of the right and left eye lenses, right and left intermediate gears disposed between the right and left ring gears and engaged respectively to the right and left ring gears, the intermediate gears connected to the magnification adjustment elements for adjusting magnification of the lens elements with rotation of the intermediate gears, engagement means operatively connected between the intermediate gears for transmitting rotation between the right and left intermediate gears, said engagement means including at least one element which is substantially coaxially mounted with respect to the machine shaft axis for transmitting rotation between the right and left gears to an extent which is only slightly effected by a pivoting of the right and left eye lenses about the machine shaft axis, a small gear fixedly connected to one of the intermediate gears and concentric with an axis of the one intermediate gear for



rotation therewith, a drive gear mounted for rotation about an axis of one of the ring gears and rotatable independently of the one ring gear, said drive gear engaged with said small gear and having a rotation ratio so that a small rotation of the drive gear causes a large rotation of the small gear, and a zooming lever connected to the drive gear for rotating the drive gear which in turn rotates the small gear for turning the one intermediate gear which turns the other intermediate gear over the engagement means whereby the right and left ring gears are rotated and the magnification of the eye lenses is adjusted.

4,616,908

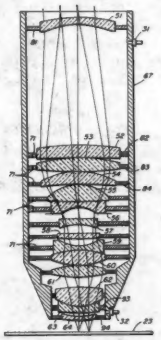
MICROLITHOGRAPHIC SYSTEM

Michael C. King, Carlisle, Mass., assignor to GCA Corporation, Andover, Mass.

Filed Jul. 19, 1984, Ser. No. 632,449

Int. Cl.⁴ G02B *3/12, 7/00*

U.S. Cl. 350—576 **1 Claim**



1. In a microlithographic system for projecting a reduced image of a reticle onto the surface of a semiconductor wafer for creating circuit patterns thereon, an optical system comprising:

a reticle holder;

aligned with said reticle holder, a wafer stage;

on the axis between said reticle holder and wafer stage, a lens for projecting an image of a reticle held in said holder onto a wafer held on said stage, said lens comprising a plurality of spaced, axially-aligned, optically-transmissive, refractor elements and tubular lens holder means for sup-

porting and enclosing said elements, the holder means being essentially sealed to the two endmost of said elements, the interior spaces between successive elements being vented to each other;

first port means communicating with the interior of said holder means between one endmost element and the respective adjacent element;

second port means communicating with the interior of said holder means between the other endmost element and the respective adjacent element;

means for applying a controlled flow of helium gas to said first port means; and

means for venting helium from said holder through said second said port means, the space between the lens and the reticle holder and the space between the lens and wafer stage being open to the atmosphere and subject to barometric changes.

4,616,909

BOWL-SHAPED REFLECTOR MEMBERS FOR PARABOLIC REFLECTORS

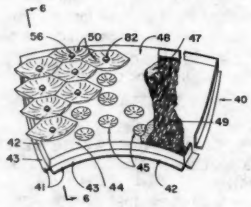
John A. Dane, 8823 Shellie La., Boise, Id. 83704

Filed Nov. 7, 1984, Ser. No. 668,899

The portion of the term of this patent subsequent to May 27, 2003, has been disclaimed.

Int. Cl.[4] G02B *7/18, 5/10*

U.S. Cl. 350—613 **9 Claims**



1. Reflector members for a parabolic reflector having reflector support panels, each of said reflecting members mountable upon a selected support panel, and each of said reflecting members having a concave reflecting surface terminating in a rim lying in a single plane, the rim defining a polygon.

4,616,910

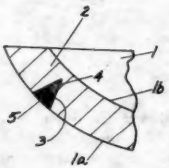
VISUAL INDICATOR ON SOFT CONTACT LENSES

Robert E. Klein, 7350 Willow Brook La., Cincinnati, Ohio 45237

Continuation-in-part of Ser. No. 471,187, Mar. 1, 1983, abandoned. This application Feb. 24, 1984, Ser. No. 581,098

Int. Cl.[4] G02C *7/04*

U.S. Cl. 351—162 **17 Claims**



1. A visual indicator on an optical lens, said indicator having an appearance, when viewed from the exterior surface of said lens, which is distinctly different from its appearance when viewed from the inner surface of said lens, said indicator comprising two superposed parts, each of which, when viewed from its respective side of said lens, in part at least masks the other to achieve said distinct appearance difference, whereby said indicator will visually distinguish one side of said lens from the other.

4,616,911

METHOD FOR A NON-RETARDED SHUTTER RELEASE OF ROTARY SHUTTERS IN PHOTOGRAMMETRIC AERIAL CAMERAS

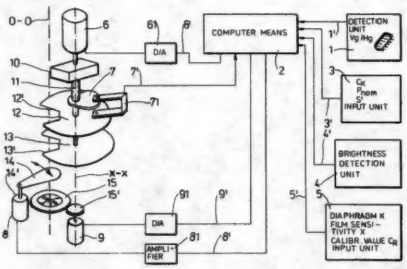
Ulrich Zeth; Wilfried Rempke, and Klaus-Ditmar Voigt, all of Jena, German Democratic Rep., assignors to Jenoptik Jena G.m.b.H., Jena, German Democratic Rep.

Filed May 28, 1985, Ser. No. 738,313

Claims priority, application German Democratic Rep., Jun. 14, 1984, 2641354

Int. Cl.[4] G03B *29/00*

U.S. Cl. 354—66 **3 Claims**



1. A method for non-retarded triggering of a rotary section shutter in aerial cameras for taking aerial photographs of a terrain from an aircraft or the like, having an exposure time control, a diaphragm control, and a shutter control, a computer means, the former being connected to the computer means, a removable light stop for blocking an exposure beam to prevent undesired exposure, comprising the steps of

computing a sequence time of photographs t_{BF} from the relation between the speed of flight V_g and the height of flight h_g of said aircraft and from a set degree of overlap P_{nom} of each two subsequent photographs, computing from the brightness of the terrain and from the film material sensitivity a diaphragm and exposure time setting value,

feeding said diaphragm and exposure time setting value into the diaphragm control and the shutter control, respectively, thus defining feasible exposure points of time via the rate of revolution of said rotary sectors of the shutter,

feeding the feasible exposure points of time into the computer means,

computing $\Delta t_{v\ddot{o}}$ being the interval between two feasible exposure points of time, varying $\Delta t_{v\ddot{o}}$ to $\Delta t^*_{v\ddot{o}}$ to satisfy the condition $T_{BF}=n\cdot\Delta t^*_{v\ddot{o}}$,

wherein n is any suitable integer,

computing correction signals from $\Delta t^*_{v\ddot{o}}$,

applying said correction signals to the shutter control for varying the rate of revolutions of the rotary sectors of the shutter, thus minimizing the difference between a preset exposure time and the exposure time realised by the rate of revolutions of the rotary sector shutter, and

removing the light stop out of the exposure beam for exposure of a film material.

4,616,912
APPARATUS FOR THE PHOTOGRAPHIC RECORDING OF PLATE THERMOGRAPHY

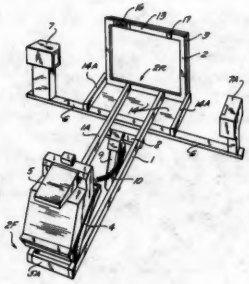
Andreas O. Johnsen, Griesheim, Fed. Rep. of Germany, assignor to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Sep. 13, 1984, Ser. No. 650,088

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1983, 8326341[U]

Int. Cl.⁴ G03B *29/00*

U.S. Cl. 354—80 **6 Claims**



1. A compact apparatus of light-weight construction for the performance and simultaneous photographic recording of plate thermography, comprising a pair of spaced generally parallel straight rails having pairs of opposed free ends; a frame mounted on and at right angles to one of said pairs of free ends and including means for holding a thermographic plate thereon, a camera mount secured to the other pair of said opposed free ends for supporting a camera thereon with the camera lens located substantially in alignment with the center of said frame and with the front of the lens parallel thereto, said mount interconnecting the two rails; said means for holding a thermographic plate being formed of plastic and located on the side of said frame away from the camera; at least one cross bar secured and extending transversely to the rails at said one end of said pairs of free ends; a pair of photographic flash units mounted in fixed spaced relation on said cross bar adjacent said frame and facing each other parallel to said frame; a camera grip; means for mounting said grip obliquely at the approximate center of gravity of the compact apparatus between said two rails; and cable means connected to said grip for tripping said flash units and a camera.

4,616,913
CAMERA

Masayuki Suzuki; Hidehiko Fukahori; Masaharu Kawamura; Yoshihito Harada; Ryuichi Kobayashi, all of Kanagawa, and Tsunemasa Ohara, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 30, 1985, Ser. No. 739,383

Claims priority, application Japan, May 30, 1984, 59-110062

Int. Cl.⁴ G03B *1/18*

U.S. Cl. 354—173.1 **13 Claims**

1. A camera comprising:

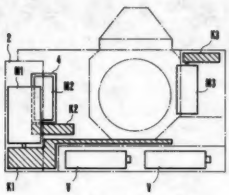
(a) a shutter charging transmission system;

(b) a first electric motor for driving at least said shutter charging transmission system;

(c) a film winding transmission system;

(d) a second electric motor for driving at least said film winding transmission system;

(e) a film rewinding transmission system; and



(f) a third electric motor for driving said film rewinding transmission system.

4,616,914
LIGHT-TIGHT CASSETTE

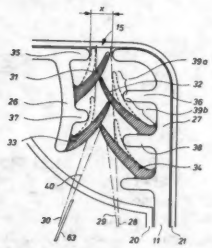
Edward Buelens, Kontich, and Carolus C. Goossens, Berchem, both of Belgium, assignors to AGFA-Gevaert N.V., Mortsel, Belgium

Filed Feb. 21, 1985, Ser. No. 703,660

Claims priority, application European Pat. Off., Feb. 28, 1984, 84200276.8

Int. Cl.⁴ G03B *17/26*

U.S. Cl. 354—277 **11 Claims**



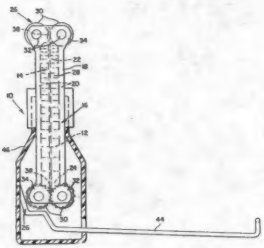
1. A light-tight cassette for holding a roll of light-sensitive material, which cassette has a peripheral exit slot defined between opposed spaced apart generally parallel slot walls and through which light-sensitive material can be drawn from the roll along a path therethrough, and light-sealing means within said slot for making light-sealing contact with the light-sensitive material during its passage through said slot, said light-sealing means comprising at least one pair of opposed flexible lips, each projecting from one slot wall at an angle thereto in converging relation to the other in the direction of passage of the light-sensitive material through the slot and into generally overlapping relation adjacent their free ends, said ends being adapted to flex away from the opposing lip toward the corresponding side wall during passage of said material therebetween, and generally rigid stop means disposed in the included angle between each such lip and the corresponding slot wall and adapted to limit flexing of the respective free lip ends toward the corresponding side wall to maintain sealing contact with said material during passage through said slot.

4,616,915

IMMERSION TYPE FILM PROCESSING APPARATUS

Philip R. Norris, Reading, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 30, 1984, Ser. No. 677,090
Int. Cl.[4] G03D *3/08*
U.S. Cl. 354—320 4 Claims



1. Photographic processing apparatus comprising:

a plurality of elongated wall members connected together to define an elongated open ended space adapted to accommodate an exposed photographic film unit therein; and

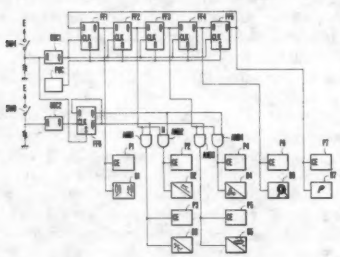
means for cooperating with said wall members adjacent said open end of said space defined thereby to effect a fluid seal thereat, thereby facilitating the retention of a reservoir of photographic film processing fluid within said space, and for selectively advancing an exposed fluid treated, processed film unit from said fluid containing space, said fluid seal effecting and fluid unit advancing means comprising a pair of elongated rollers disposed in parallel relationship, each of said rollers including a resiliently flexible peripheral surface portion, which two said peripheral surface portions being disposed in engagement one with the other and which further are configured to substantially exclusively engage said wall members to provide both a static and a dynamic fluid seal adjacent said open end of said space, said rollers when actuated adapted to withdraw therebetween a fluid treated, processed film unit from said fluid containing space.

4,616,916

EXPOSURE CONTROL MODE SELECTING DEVICE FOR CAMERA

Hiromi Someya, Kanagawa; Yoshihiko Aihara, Tokyo; Nobuyuki Suzuki, and Toyokazu Mizogui, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1985, Ser. No. 722,166
Claims priority, application Japan, Apr. 13, 1984, 59-75385
Int. Cl.[4] G03B *7/097*
U.S. Cl. 354—442 23 Claims



1. A photographic mode setting device for a camera which can set a plurality of photographic modes constituting a first group and a plurality of photographic modes different from said first group and forms pictograph displays corresponding to each one of said set photographic modes, comprising:

(a) a first operating member for setting a desired one of the photographic modes of said first group;

(b) a designating circuit for selectively designating the photographic mode of the first group set by said first operating member;

(c) a selection circuit for permitting designation of a mode different from the first group only when a specific photographic mode out of said first group has been selected; and

(d) a second operating member for causing said selection circuit to perform a selecting action of said different photographic mode from the first group only under when said certain specific photographic mode of the first group has been selected;

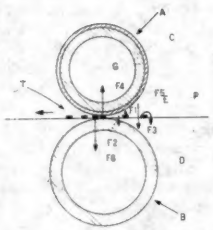
whereby setting of a mode by the second operating member does not occur when said certain specific photographic mode is not set by said first operating member, but only when said certain specific photographic mode is selected setting of the certain specific mode by operating the second operating member.

4,616,917

FIXING DEVICE

Masaaki Sakurai, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1983, Ser. No. 542,103
Claims priority, application Japan, Oct. 20, 1982, 57-183996
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 FU 44 Claims



1. A fixing device for fixing material having a predetermined electric polarity to a face of a recording material, comprising:

a first rotatable member mounted to contact the face of the recording material which carries the material to be fixed;

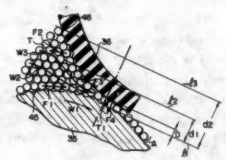
a second rotatable member cooperable with said first rotatable member to transport therebetween the recording material, said second rotatable member having a surface layer adapted to contact a face of the recording material opposing said face that carries the material to be fixed;

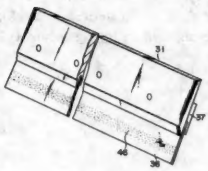
wherein said surface layer of said second rotatable member contains an electrification agent which causes triboelectrical charging of the surface of said surface layer to a polarity opposite to the predetermined polarity to urge the material to be fixed toward the recording material, and wherein an electric field is formed between said surface layer and the material to be fixed and is stronger than an electric field formed in a region prior to entry of the recording material between said first and second rotatable members, by the potential of the recording material with respect to the material to be fixed.

4,616,918
DEVELOPING APPARATUS

Mitsuaki Kohyama, Tokyo, and Takashi Shimazaki, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 1, 1984, Ser. No. 636,605
Claims priority, application Japan, Aug. 4, 1983, 58-143340
Int. Cl.⁴ G03G *15/08*
U.S. Cl. 355—3 DD **15 Claims**



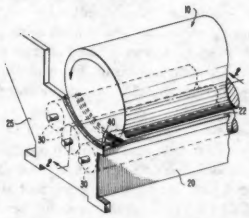


1. A developing apparatus comprising a developing agent carrier for carrying a developing agent thereon, and an elastic member pressed against the surface of the developing agent carrier to apply the developing agent thereto, so that the developing agent is applied to the surface of the developing agent carrier by the elastic member to form a thin layer on the surface of the developing agent carrier, and that the thin layer is opposed to an image carrier at a predetermined space to deposit the developing agent on a latent image on the image carrier, wherein a first rugged surface portion is formed on that part of the surface of the elastic member which faces the developing agent, carrier, said first rugged surface portion being located in a region on the upper-course side with respect to the flow of the developing agent and not in contact with a monolayer of the developing agent touching the surface of the developing agent carrier.

4,616,919
NON-CONTACT DEVELOPER SEAL

James M. Adley, Longmont, and Phillip Chang, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 5, 1985, Ser. No. 772,806
Int. Cl.⁴ G03G *15/08*
U.S. Cl. 355—3 DD **9 Claims**



1. A sealing apparatus in an electrophotographic development device comprising:

a developer housing having a magnetic roll rotatably mounted about its axis above a developer sump containing a carrier mix having toner and toner beads;

a photoconductor movable in close proximity to said magnetic roll;

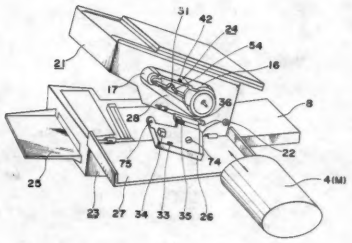
a seal positioned between said magnetic roll and said photoconductor;

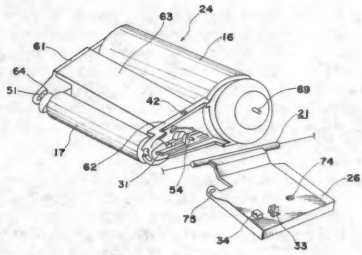
means for effectuating a differential air flow above said seal and below said moving photoconductor said differential air flow inhibiting the toner dust and bead carryout of the carrier mix from axially migrating along said magnetic roll past said seal.

4,616,920
COPYING MACHINE HAVING AN ENDLESS PHOTORECEPTOR BELT

Masakatsu Itoigawa, Nara, and Masaru Nishijima, Hirakata, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 17, 1984, Ser. No. 682,349
Claims priority, application Japan, Dec. 20, 1983, 58-242549; Dec. 23, 1983, 58-252161; Dec. 26, 1983, 58-250750; Dec. 27, 1983, 58-249984
Int. Cl.⁴ G03G *15/00*
U.S. Cl. 355—3 BE **13 Claims**





1. A copying machine, comprising:

a roller unit including a driving roller and an idler roller positioned substantially parallel to each other, said roller unit having opposite ends in the axial direction of said rollers;

an upper frame for carrying said roller unit and a lower frame for supporting said upper frame, said upper frame being movable between an open position and a closed position with respect to said lower frame;

an endless photoreceptor belt mounted on said driving and idler rollers;

first supporting means for supporting one end of said roller unit;

moving means for moving said idler roller between a tension-released position, in which the distance between said driving roller and said idler roller is narrowed to loosely mount said photoreceptor belt thereon, and a tension-

applied position, in which the distance between said driving roller and idler roller is widened to apply a predetermined tension to the mounted photoreceptor belt; and

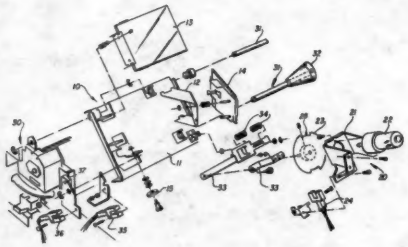
second supporting means provided to move between an attached position and detached position, such that when said second supporting means is in the attached position, said other end of said roller unit is supported by said supporting means and, when said second supporting means is in the detached position, said other end of said roller unit is free from attachment with said second supportin means, thereby enabling the removal and mounting of said endless photoreceptor belt in the axial direction of said rollers while said second supporting means is in said detached position.

4,616,921

READER-PRINTER APPARATUS WITH AN IMPROVED VIEWING AND PRINT MIRROR ASSEMBLY

Gary R. Matson; Winston G. Pottle, and Francis L. Soucy, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 29, 1985, Ser. No. 727,992
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—5 **4 Claims**



1. Reader-printer apparatus for viewing and reproducing a microform image including means for projecting an enlarged image of the microform image onto a view screen; means for projecting microform image modulated light; and copier means having a photoconductive member for receiving such projected image modulated light to produce a latent image, and image processing means for reproducing a visible image from such latent image on a copy sheet, the improvement comprising:

a mirror assembly which includes a view mirror moveable between viewing and non-viewing positions, a print mirror moveable between print and non-print positions, control means effective in a first state to move said viewing mirror to its viewing position and said print mirror to its non-print position and effective in a second state to move said view mirror to its non-viewing position and said print mirror to its print position; and

motor driving means coupled to said mirror assembly for selectively causing said control means to be effective in either the first or second states.

4,616,922

ELECTROPHOTOGRAPHIC COPYING APPARATUS AND PROCESS

James F. Sobieski, Mahtomedi, and Robert A. Muehlhausen, Marine, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 5, 1985, Ser. No. 720,089
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 R **6 Claims**

1. An electrophotographic copying apparatus for providing copies by reproducing images onto receptor sheets comprising:

an endless photosensitive element rotatably mounted and having a surface length at least twice the length of a said receptor sheet;

drive means for revolving said photosensitive element;

charging means for selectively imparting a substantially uniform electrical charge to an area of said photosensitive element;

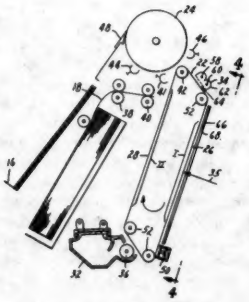
exposing means for selectively imagewise exposing said photosensitive element to produce a latent electrostatic image at said charged area of said photosensitive element;

developer means for selectively developing said photosensitive element by imparting toner to said latent image on said photosensitive element;

transfer means for effecting the transfer of said toner from said photosensitive element to a said receptor sheet;

cleaner means for selectively cleaning said photosensitive element by removing any residual toner remaining on said photosensitive element after said transfer of said toner to a said receptor sheet;

wherein said developer means and said cleaner means are adjacent one another to define a developer/cleaner section and wherein said charging means is spaced from said



developer/cleaner section a distance sufficient so that a length along said surface of said photosensitive element at least equal to the length of a said receptor sheet exists between said charging means and said developer/cleaner section in each direction along said photosensitive element to define a first image area between said charging means and said developer/cleaner section in one direction from said charging means along said photosensitive element and a second image area between said charging means and said developer/cleaner section in the opposite direction from said charging means along said photosensitive element; and

control means for selectively activating said drive means, said charging means, said exposing means, said developer means and said cleaning means such that development and cleaning of said photosensitive element always alternates between said first image area and said second image area, regardless of whether said copying apparatus is operated in a series of single-copy modes wherein said copying apparatus intermittently produces a single copy per cycle or a multiple-copy mode wherein said copying apparatus produces a multiplicity of copies per cycle.

4,616,923

POTENTIAL CONTROL ON PHOTOSENSITIVE LAYERS IN ELECTROSTATIC CHARGING PROCESSES

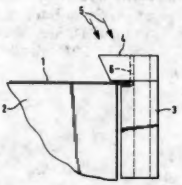
Klaus Reuter, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 14, 1985, Ser. No. 711,711

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1984, 3409701

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—14 E **25 Claims**



1. A method for maintaining a given potential ratio in the exposure of electrostatically charged light-sensitive layers on carriers, on which an electrostatic latent image of an original is formed during the exposure comprising the steps of:

(a) charging the light-sensitive layer to a given surface potential;

(b) measuring the surface potential in a bright area of the light-sensitive layer by means of an electrostatic potential detector;

(c) continuously comparing the measured surface potential with a set value of the residual potential of the light-sensitive layer; and

(d) terminating the exposure when the measured surface potential bears a predetermined relationship to the given set value.

4,616,924

CLEANING DEVICE FOR USE WITH TRANSFER TYPE ELECTROSTATIC COPYING MACHINES

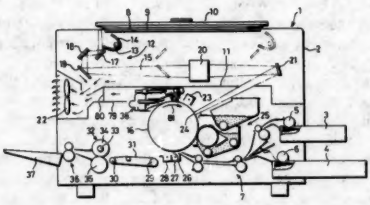
Hiroshi Kimura, Habikino; Masahiko Hisajima, Osaka; Kiyoshi Shibata, Osaka, and Kiyoshi Morimoto, Osaka, all of Japan, assignors to Mita Kogyo Kabushiki Kaisha, Japan

Filed Mar. 29, 1984, Ser. No. 594,624

Claims priority, application Japan, Apr. 1, 1983, 58-58299

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—15 **4 Claims**



1. In a cleaning device for use with a transfer type electrostatic copying machine, a wiping assembly disposed upstream of a charging-purpose corona discharger along the direction of travel of a photoreceptor to be brought into sliding contact with the photoreceptor during exposure to intercept residual toner particles on the photoreceptor, said wiping assembly comprising upstream and downstream members adapted to be brought into sliding contact with the photoreceptor, and pressure setting means for applying a first preset sliding contact pressure to the upstream member and a second, higher preset sliding contact pressure to the downstream member and for separating the upstream member and the downstream member from the photoreceptor during non-exposure to permit carrying of the intercepted residual toner particles to a developing device by movement of the photoreceptor, said pressure setting means including:

a casing,

a first arm having a first end and a second end,

a second arm having a first end and a second end and partially enclosing the first arm,

a first spring connecting the first end of the first arm to the first end of the second arm,

a pin fixed to the casing,

the second end of the first arm pivotally connected to the pin to pivotally support the first arm on the casing,

the second arm pivotally supported on the pin at a point intermediate the second arm first and second ends,

a first swing lever, having a first end and a second end,

a first rotary shaft extending parallel to an axis of the photoreceptor and coupling the upstream member to the first end of the first swing lever,

a second swing lever having a first end and a second end,

a second rotary shaft extending parallel to the axis of the photoreceptor and coupling the downstream member to the first end of the second swing lever,

a second spring connecting the second end of the second swing lever to the second end of the first swing lever,

a third spring connecting the second end of the second swing lever to the casing,

a control member fixed to the first end of the first arm and positioned between the second ends of the first and second swing levers, and

actuating means operative during exposure to push down the second end of the second arm and during non-exposure to move the second end of the second arm upwardly, whereby

during exposure, the second end of the second arm moves down to pull up the second spring and the control member which pushes up the second end of the second swing lever to bring the downstream member into sliding contact with the photoreceptor, presetting sliding contact pressure of the downstream member on the photoreceptor, and the second spring pulls up the second end of the first swing lever to bring the upstream member into sliding contact with the photoreceptor, presetting sliding contact pressure of the upstream member on the photoreceptor, and

during non-exposure the second end of the second arm moves upwardly freeing the control member from the second end of the second swing lever and the third spring pulls the second end of the second swing lever down to raise the downstream member, separating the downstream member from the photoreceptor, and the control member pushes down the second end of the first swing member to raise the upstream member, separating the upstream member from the photoreceptor.

4,616,925

READER PRINTER

Takao Saijo, Tama; Takanori Saito, Kawasaki; Kuniaki Kamimura, Ebina, and Masafumi Fujita, Kawasaki, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 19, 1984, Ser. No. 683,770

Claims priority, application Japan, Dec. 28, 1983, 58-249961

Int. Cl.[4] G03B *13/24, 13/26*

U.S. Cl. 355—44 **4 Claims**

1. A reader printer for handling an image of microfilm held by an aperture card and positioned in such a manner that the microfilm center aligns with the center of the card aperture, comprising;

means for projecting the image of microfilm onto a screen at the time of reading or onto a photosensitive member at the time of printing,

means, at the time of printing, for scanning the aperture card

across a projection axis for slit manner projection from the same scanning start position for each aperture card irrespective of film size,

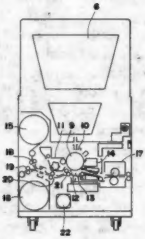
means for supplying paper web from rolled paper,

means for cutting the web supplied in a paper transporting path so as to provide a sheet paper of desired size,

means for altering a magnification ratio for projecting the image of microfilm,

means for selecting a paper cutting size to be cut by the web cutting means,

first timer means which has a timer value in accordance with



an altered magnification ratio and a selected cutting size and starts counting of the time simultaneously with the start of scanning of the microfilm,

second timer means which has a timer value in accordance with a selected cutting size and starts counting of the time simultaneously with the end of counting of said first timer, and

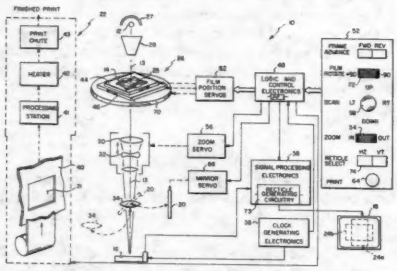
control means which controls said web supplying means and said web cutting means so that the supply of the web starts when the first timer means completes the counting of the time and the web is cut when the second timer means completes the counting of the time.

4,616,926

FILM VIDEO PLAYER/PRINTER

Matthew DiPietro, Webster, and Daniel C. Maslanka, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 28, 1985, Ser. No. 770,120
Int. Cl.[4] G03B *13/28;* H04N *5/84*
U.S. Cl. 355—45 **11 Claims**



1. In a film video player including photographic printer means for making an optical print from a photographic film corresponding to a film image displayed on a video monitor, the improvement comprising:

(a) electronic display means for selectively displaying a rectangular reticle that is substantially centered on said video monitor, the orientation of the reticle portraying the format of a print to be made; and

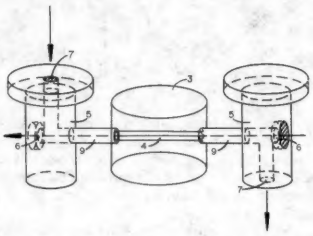
(b) logic and control means, responsive to the framing format portrayed by the reticle, for coordinating said printer means and the photographic film, to cause said printer means to make a photographic print corresponding to the image displayed in the format portrayed on said video monitor.

4,616,927

SAMPLE CELL FOR LIGHT SCATTERING MEASUREMENTS

Steven D. Phillips, Goleta; Jeffrey M. Reece, and Philip J. Wyatt, both of Santa Barbara, all of Calif., assignors to Wyatt Technology Corporation, Santa Barbara, Calif.

Filed Nov. 15, 1984, Ser. No. 671,181
Int. Cl.[4] G01N *21/00*
U.S. Cl. 356—338 **20 Claims**



1. A sample cell for measuring the light scattering properties of a liquid suspension of particles at a plurality of scattering angles, where said liquid suspension of particles is illuminated by a light beam, comprising

(a) optically polished sample channel means by which said suspended particles may be transported in a direction essentially parallel to said light beam through said sample cell;

(b) light beam entrance and exit means sealed against said sample channel means and providing windows for said light beam to enter and exit said sample channel means without contacting walls of said sample channel means during passage through the sample cell;

(c) scattered light transfer and refraction means of refractive index greater than said liquid sample and surrounding said liquid so that some light scattered by particles in said liquid may enter said refraction means;

(d) optically polished external surface means surrounding said refraction means whereby some of the light scattered by the sample that has been refracted into said refraction means will exit said surface essentially normal to it and provide, thereby, a signal that may be detected by external detector means collimated to accept light passing through said surface at said detector location and essentially passing in a direction normal to said external surface; and

(e) liquid transport means comprised of channels external and essentially normal to said illuminated sample channel through which liquid samples may be introduced to and removed from said illuminated sample channel.

4,616,928

PHOTOELECTRIC SMOKE DETECTOR WITH ADJUSTABLE BACKGROUND SIGNAL

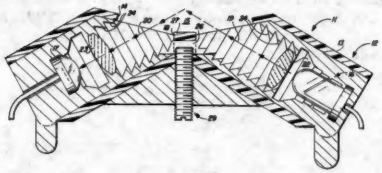
George E. Leavitt, Ashland, and Felice LoStracco, Worcester, both of Mass., assignors to Kidde, Inc., Saddle Brook, N.J.

Filed Jun. 20, 1984, Ser. No. 622,769
Int. Cl.[4] G01N *21/53*
U.S. Cl. 356—338 **16 Claims**

1. A photoelectric smoke detector comprising:

a housing means defining a test zone and an opening for admitting smoke thereinto;

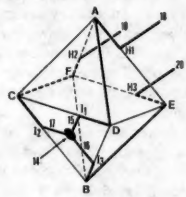
light source means arranged to direct light into said zone;
light responsive means arranged to receive light scattered by smoke particles in said zone;
optical barrier means arranged to prevent the direct transmission of light through said zone and between said light source means and said light responsive means, said barrier means defining a light passage for transmitting light directly between said light source means and said light responsive means; and
mechanical gate means projecting an adjustable distance into said passage so as to permit variation in the size thereof and consequently in the level of light transmitted directly therethrough between said light source means and said light responsive means.



4,616,929
COMPACT, INTEGRAL, 6-MIRROR, TRIAXIAL, LASER RATE GYRO

Bernard Bernelin, Antony, and Bernard de Salaberry, Versailles, both of France, assignors to Ste. Francaise d'Equipements pour la Navigation Aerienne, Villacoublay, France

Filed Mar. 20, 1981, Ser. No. 252,229
Claims priority, application France, Mar. 21, 1980, 80 06298
Int. Cl.⁴ G01C *19/64*; H01S *3/101*
U.S. Cl. 356—350 **7 Claims**

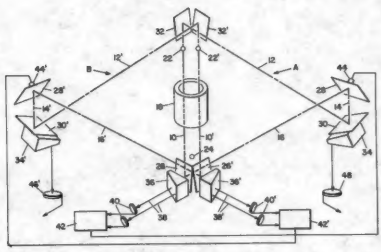


1. A triaxial laser gyroscope having three sensing axes and being adapted to produce simultaneously distinct measurements of angular movement around each of said axes, comprising:
(a) a solid body;
(b) three square-shaped optical paths formed in said body and arranged mutually orthogonally with respect to each other, the geometrical axis of each of the square shapes defined by said paths corresponding to respective ones of said sensing axes; each of said paths comprising four coplanar, linearly extending capillaries arranged to form said square shapes, said paths being situated such that any two opposite corners of one square path coincide with two opposite corners of one of the other square paths, whereby said capillaries are arranged to form an octahedron having six apexes, each of said apexes corresponding to one of said respective sets of two coinciding corners; and
(c) six optical mirrors located respectively at said six apexes, each of said mirrors intersecting the four respective capillaries forming the respective apex, and each of said mirrors being effective in two of said optical paths.

4,616,930
OPTICALLY BIASED TWIN RING LASER GYROSCOPE

Graham J. Martin, Canoga Park, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Apr. 20, 1983, Ser. No. 486,662
Int. Cl.⁴ G01C *19/64*
U.S. Cl. 356—350 **5 Claims**



1. A ring laser rotational rate sensor of the type wherein counter-rotating beams of laser light are utilized to measure the rate of rotation of said sensor comprising, in combination:
(a) first and a second lasing cavities comprising mirror images of one another and arranged substantially back-to-back;
(b) each of said first and said second lasing cavities comprising four substantially straight segments arranged to form an out-of-plane shape, portions of said cavities intersecting so that a corresponding segment of each cavity lies entirely within the other cavity;
(c) said cavities sharing a common fill gas;
(d) a common cathode associated with each of said corresponding segments so that a common gas discharge laser gain medium is shared by said cavities;
(e) a plurality of mirrors arranged adjacent the intersections of said cavity segments so that at least one circularly polarized mode may resonate within each cavity;
(f) means for applying a common magnetic field to said gas discharge laser gain medium whereby equal and opposite optical biases are effected in said cavities; and
(g) means for combining the energy within said first and second lasing cavities to produce a measurement of rotation of said sensor.

4,616,931
PROCESS AND DEVICE FOR THE CONTACT FREE DETERMINATION OF THE MOVEMENT OF AN OBJECT

Urs-Peter Studer, Riehen, Switzerland, assignor to Zumbach Electronic AG, Orpund, Switzerland

Filed Nov. 7, 1983, Ser. No. 549,507
Claims priority, application Switzerland, Nov. 12, 1982, 6600/82
Int. Cl.⁴ G01B *11/14*
U.S. Cl. 356—373 **6 Claims**

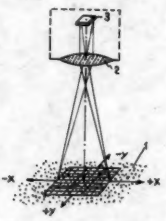
1. A process for the contact-free determination of the movement in at least one dimension of an object of optically differentiatable structure, including the steps of
providing a grid of opto-electric transducers comprising at least one group of four similar opto-electric transducers forming a row extending in one of said dimensions,
projecting a light image of the object onto said grid of opto-electric transducers, whereby each of said for transducers produces a signal A to D,
deriving from each group of four opto-electric transducers

two phase-shifted signals I and II which vary priodically with a frequency determined by the speed of said object as follows:

$$I=(A+B)-(C+D)$$

and

$$II=(B=C)-(D+A)$$



determining said speed from said frequency and determining the direction of said movement of said object from the phase of said signals.

4,616,932

METHOD OF OBSERVING CHANGE IN A SHAPE

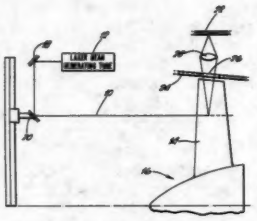
Richard J. Parker, Derby, England, assignor to Rolls-Royce plc, London, England

Filed Sep. 18, 1984, Ser. No. 651,853

Claims priority, application United Kingdom, Nov. 1, 1983, 8329161

Int. Cl.[4] G01B *11/24*

U.S. Cl. 356—376 **6 Claims**



1. A method of observing change in the shape of a bodily rotating blade comprising the steps of:

directing a collimated beam of light onto the blade at such an angle relative to a flank of the blade as to enable traversing of the flank by the light beam in a direction chordally of the blade as it rotates;

exposing a light sensitive, signal generating means to the resulting light spot at the point of contact between the beam and the blade to generate exposure signals;

simultaneously using a means to derive signals representative of the rotational speed of the blade;

and using signals generated by the exposure in conjunction with signals which relate the rotational speed of the blade with the generating said signals, to produce a visual display of the blade shape on display means.

4,616,933

PROCESS AND APPARATUS FOR MAKING A NUMERICAL DETERMINATION OF THE COLOR, OR OF A CHANGE IN COLOR, OF AN OBJECT

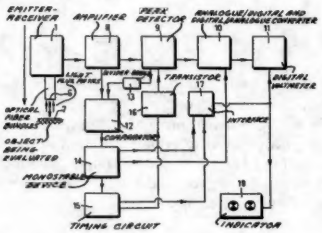
Jean-Luc M. Lévêque, Montfermeil, and Gilbert J. Gras, Aulnay-Sous-Bois, both of France, assignors to L'Oreal, Paris, France

Continuation-in-part of Ser. No. 186,325, Sep. 11, 1980, abandoned. This application Mar. 27, 1984, Ser. No. 593,882

Claims priority, application France, Sep. 13, 1979, 79 22881

Int. Cl.[4] G01J *3/51*; G01N *21/55*

U.S. Cl. 356—416 **17 Claims**



1. Apparatus for making numerical-determination of one of the colors or of a change in a given color of an object, which apparatus is comprised of:

(a) a source of light to irradiate the object whose numerical-determination of color is desired and to be found;

(b) a photo transducer measn to pick up the light returned by the object;

(c) optical fiber receiving means to direct the light returned by the object to the said photo transducer means; with

the said optical fiber receiving means having an end that is displaceable substantially perpendicularly to the said object being investigated whose numerical-determination of color is desired and to be found in order to obtain such desired determination;

(d) optical fiber emitter means having an end to direct the emission of said light source to a said object being investigated, said optical fiber receiving means and said emitter means being coaxially disposed at least at said ends to provide coaxial ends and to provide first and second optical fiber bundles; with

said optical fiber emitter means and said optical fiber receiving means being disposed as a unit to be passed within and to make traversing entry substantially perpendicularly into a zone of access wherein is located the object to be investigated;

(e) signal processing means for determining the value of the maximum of the signal supplied by the photo transducer means during the displacement of the said optical receiver means; with said signal processing means including means to provide said maximum signal value determination substantially instantaneously at the time during displacement of the said end of the optical receiving means when said receiving means is at least in very near maximum signal-generating proximity of contact with said object to be investigated; and

(f) a display unit responsive to said signal processing means for substantially instantaneously displaying information according to the determination made; with

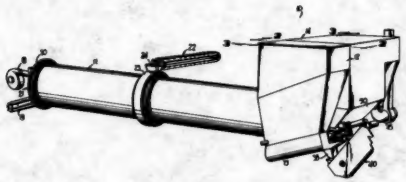
(g) means associated with said apparatus assembly for moving said coaxial ends of said first and second optical fiber bundles in said unit towards and away from said object.

4,616,934

DRUM MIX ASPHALT PLANT WITH KNOCK-OUT BOX AND SEPARATE COATER

J. Donald Brock, P.O. Box 2787, 4101 Jerome Ave., Chattanooga, Tenn. 37407

Filed Nov. 5, 1984, Ser. No. 668,290
Int. Cl.[4] B28C 5/46
U.S. Cl. 366—4 26 Claims



1. In an asphalt plant including an inclined rotary drum dryer operative to heat and to dry aggregate material introduced into said drum dryer and to discharge said aggregate material from the lower end of said drum dryer, said drum dryer including a heat source at the upper end thereof and exhaust means for drawing a flow of gases from the upper end of said drum dryer out of the lower end of said drum dryer, the improvement comprising:

mixing means positioned below the lower end of the drum dryer to directly receive the aggregate material discharged from the drum dryer;

collection means for causing particulate matter suspended in said flow of gases to drop directly into said mixing means; and

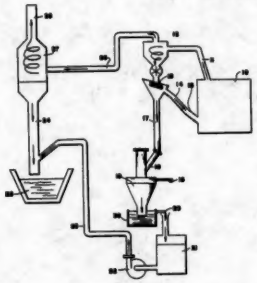
means for introducing liquid asphalt into said mixing means.

4,616,935

APPARATUS AND PROCESS FOR BOILER ASH COLLECTION

James E. Harrison, and John B. Presnell, both of Port St. Joe, Fla., assignors to St. Joe Forest Products Company, Port St. Joe, Fla.

Filed Dec. 19, 1984, Ser. No. 683,584
Int. Cl.[4] B01F 15/02
U.S. Cl. 366—165 9 Claims



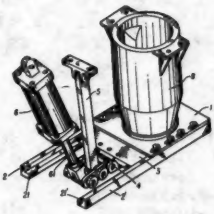
1. An apparatus for continuously mixing dust and water for disposal purposes, comprising a vertical pipe with a removable cover at its upper end and with its lower end opening into an enclosed chamber, an inlet opening into the side of said pipe at an acute angle thereto for introducing dust particles thereinto, said chamber having its upper end closed except for said pipe and said inlet and its lower end submerged in a pool of water, a plurality of water inlets discharging substantially horizontally and tangentially with respect to the walls of said chamber into the upper end of said chamber, an inlet for introducing water into said pool, an annular ring concentrically placed around the lower end of said pipe and spaced outwardly from said pipe and inwardly from said water inlets, an outlet for continuously removing a mixture of water and dust from said pool, and means for maintaining said chamber at subatmospheric pressure.

4,616,936

CONSTRUCTION OF A FOAMING MACHINE

Huang Ber-Fong, 10-4/F, No. 1, Fu Hsing South Rd., Sec.1, Taipei, Taiwan

Filed Sep. 10, 1984, Ser. No. 649,015
Int. Cl.[4] B01F 15/02
U.S. Cl. 366—193 3 Claims



1. A lower cover device for a foaming machine which includes an agitator barrel having an open bottom, comprising:

a base plate having an aperture therein attached to the bottom of said agitator barrel, said base plate being provided on bottom edges thereof with a pair of opposed inwardly facing L-shaped support rails and a cross plate therebetween at one end;

a control gate supported between said support rails for longitudinal horizontal motion thereon; and

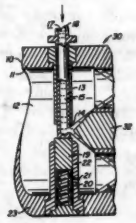
driving means for said control gate comprising a connecting block pivotally attached to one end thereof, a generally vertical connecting rod pivotally connected to said connecting block and to a fixed member adjacent said agitator barrel, and a substantially vertical driving cylinder similarly connected to said connecting block and said fixed member and operable to move said control gate forward on said support rail to cover said aperture and to move said support gate backward on said support rails to open said aperture at the bottom of said agitator barrel.

4,616,937

INTERMITTENT MIXING APPARATUS

L. Tony King, Long Beach, Calif., assignor to Komax Systems, Inc., Long Beach, Calif.

Filed Apr. 16, 1985, Ser. No. 723,832
Int. Cl.[4] B01F 5/06, 15/02
U.S. Cl. 366—336 15 Claims



1. A material mixing apparatus for the mixing of two or more fluids comprising:

A. a substantially tubular conduit for the passage of a first fluid;

B. a casing passing through said tubular conduit and eminating substantially radially toward the center of the conduit;

C. a quill which is slideably located within said casing, said quill being substantially hollow for the passage of a second fluid through said quill which is further characterized as possessing a discharge port for discharging said second fluid into a stream of said first fluid when the quill is radially extended within said casing, but which is blocked by the casing, when the quill is not fully extended; and

D. mixing means located downstream of the discharge port of the quill for mixing said first and second fluids.

4,616,938

APPARATUS FOR MEASURING THERMAL AND OTHER QUANTITIES OF SUBSTANCES

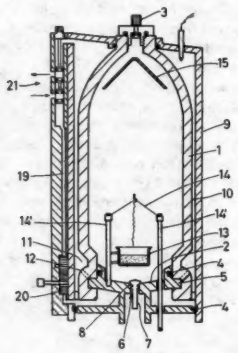
John A. Bonnard, Johannesburg, South Africa, assignor to Leco Corporation, St. Joseph, Mich.

Filed Jan. 6, 1984, Ser. No. 568,688

Claims priority, application South Africa, Jan. 10, 1983, 83/0122

Int. Cl.⁴ G01K *17/00, 25/30*

U.S. Cl. 374—38 **9 Claims**



1. Apparatus for measuring thermal quantities of combustible substances comprising a support structure to which a pressure vessel is mounted in use, the pressure vessel having a closure cap associated therewith which together form a combustion chamber, adapted to receive a sample of the combustivle substance therein, an ignitor element adapted to fire the substance in use, a feed conduit adapted to supply a combustion supportive to the pressure vessel in use, temperature measuring equipment being associated with the pressure vessel and temperature loss control means surrounding at least the major portion of the vessel the temperature of the pressure vessel and temperature loss control means each being controlable to give similar initial temperature for a plurality of tests; and

an atomic radiation source and co-operant reading equipment associated therewith through which a sulphur absorbing liquid, located in the pressure vessel during combustion, is passed after combustion has occured in use, said reading equipment adapted to indicate the sulphur content of the sulphur absorbing liquid when the liquid is exposed to the radiation source in use.

4,616,939

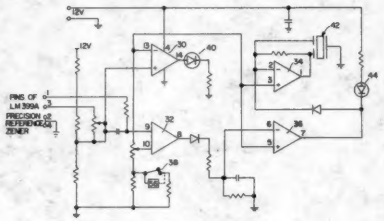
APPARATUS FOR TESTING DIAMONDS

Meir Gitlis, Moshav Bnei Atarot, Israel

Filed May 15, 1984, Ser. No. 610,353

Int. Cl.⁴ G01N *25/18*

U.S. Cl. 374—44 **5 Claims**



1. Apparatus for testing diamonds for genuineness by sensing the thermal conductivity of a substance tested comprising:

a housing;

a probe tip mounted in said housing and formed of a conductive material;

a voltage stabilizer located in said housing remote from said probe tip and coupled to the probe tip by a conductor, said voltage stabilizer being operative to provide an output voltage which varies as a function of the temperature of the conductive probe tip;

indicating apparatus operative to provide a sensible output indication of genuineness of said diamonds in response to the output voltage from the voltage stabilizer; and

means for sensing the pressure of the probe tip on the substance being tested and apparatus for calibrating the sensed conductivity of the substance being tested in accordance with the sensed pressure.

4,616,940

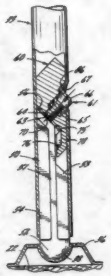
VERTICALLY ADJUSTABLE ROTATABLE SHELF ASSEMBLY

William DeBruyn, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.

Filed Mar. 18, 1985, Ser. No. 713,278

Int. Cl.⁴ F16C *23/02;* **A47B** *81/00;* **A47F** *3/10*

U.S. Cl. 384—248 **10 Claims**



1. A rotatable post assembly comprising upper and lower opposing bearing members, an elongated post extending vertically between said bearing members and having an upper end portion rotatably supported by said upper bearing member, the lower end portion of said post being tubular, a slide having upper and lower end portions and telescoped into the lower end portion of the post, a bearing element on the lower end portion of said slide and located below the lower end portion

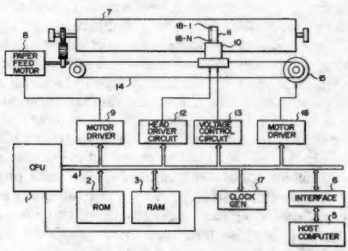
of said post to engage said lower bearing member and rotatably support the lower end portion of the post, a downwardly inclined surface formed on the upper end portion of said slide, a threaded hole, and a screw having a shank extending through one side of said post and threaded into said hole, the axis of said screw being inclined at an acute angle relative to the longitudinal axis of said post and being disposed substantially perpendicular to said inclined surface, the inner end of said screw slidably engaging said inclined surface whereby tightening of said screw forces said slide downwardly relative to said post while loosening of said screw permits said slide to move upwardly relative to said post.

4,616,941

THERMAL DOT TYPE PRINTING APPARATUS

Junshiro Nagai, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Mar. 15, 1985, Ser. No. 712,393
Claims priority, application Japan, Mar. 26, 1984, 59-57759
Int. Cl.[4] B41J *3/12, 3/20*
U.S. Cl. 400—120 **18 Claims**



1. A thermal dot type printing apparatus, comprising:

a thermal head having N heating elements arranged in a line;

transfer means for moving said thermal head in a printing direction;

head driver means for allowing current to selectively flow through said heating elements in accordance with N-bit dot data to establish a printing cycle in which dots corresponding to the selected heating elements in said line are printed;

means for setting a predetermined fixed unit time during which time a certain number of said printing cycles are effected;

counting means for counting in a first counting direction the total number of said heating elements energized by said head driver means during said fixed unit time; and

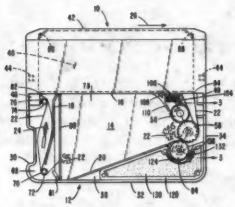
control means for sequentially supplying a plurality of N-bit dot data constituting character data to be printed to said head driver means, and for supplying a control signal in accordance with count data determined by said counting means to said head driver means, so that current supplied by said driver means upon each said printing cycle to said heating elements is set in accordance with a change in the total number of said heating elements which have been energized in said fixed unit time.

4,616,942

RIBBON CASSETTE WITH RE-INKING MECHANISM

Hideo Nagasawa, Oisomachi; Masao Suzuki, Yokohama, and Tsutomu Hamano, Odawara, all of Japan, assignors to NCR Corporation, Dayton, Ohio

Filed Feb. 28, 1984, Ser. No. 584,378
Claims priority, application Japan, Aug. 22, 1983, 58-151738
Int. Cl.[4] B41J *32/02*
U.S. Cl. 400—196.1 **12 Claims**



1. Re-inking means for a ribbon in a cassette comprising:

ink supply including a first ink carrying porous element of one density and a second ink carrying porous element of a greater density in contact with the first ink carrying porous element for transferring ink therefrom to the second ink carrying porous element,

roller means comprising a drive roller and a driven roller engageable for driving said ribbon for use in printing operations, and an

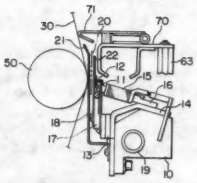
ink transfer roller engageable by said ribbon and in contact with the second ink carrying porous element of the ink supply means and driven by said driven roller of the ribbon driving roller means, said ink transfer roller having a plurality of uneven portions on the periphery thereof for carrying ink from the second ink carrying porous element of the ink supply means to the ribbon upon rotation of the driven roller of the ribbon driving roller means and of the ink transfer roller with the ribbon therebetween.

4,616,943

APPARATUS FOR PREVENTING THE RISE OF AN INK RIBBON

Yoshikane Matsumoto, and Toshio Hiki, both of Ibaraki, Japan, assignors to Hitachi Koki Company, Limited, Tokyo, Japan

Filed Mar. 9, 1984, Ser. No. 587,786
Claims priority, application Japan, Mar. 11, 1983, 58-41149; Nov. 5, 1983, 58-208077
Int. Cl.[4] B41J *35/26*
U.S. Cl. 400—247 **10 Claims**



1. In an apparatus for preventing the rise of an ink ribbon in a dot-line printer including a reciprocably driven hammer unit carrying a plurality of dot printing hammers spaced laterally apart from each other along the direction of a line to be printed, said ink ribbon being in the form of a tape and positioned to travel in said direction in front of said hammer unit, and a main ribbon separator disposed between said ribbon and

a paper to be printed, the improvement comprising a front yoke in the form of a plate defining a front portion of said hammer unit for guiding the travel of said ink ribbon past said printing hammers, and an auxiliary ribbon separator in the form of a plate attached to at least one end of said front yoke wherein said auxiliary ribbon separator extends beyond a corner of an upper end of said front yoke and covers the corner of said front yoke at its upper end to prevent said ribbon from contacting said corner and being caught thereon in the event that said ribbon is vertically displaced.

4,616,944

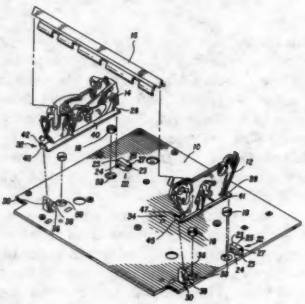
PRINTER FRAME ASSEMBLY AND METHOD OF ASSEMBLY

Matthew J. Galatha, Charlotte; David V. Iorio, Harrisburg, and Carl W. Robinson, Charlotte, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 11, 1984, Ser. No. 619,228

Int. Cl.[4] B41J *29/02*

U.S. Cl. 400—692 **6 Claims**



1. A printer frame assembly comprising:

a base member having first and second flexure latches;

said flexure latches each having a locking surface included therein;

first and second side frame members each having a front end and a rear end including locking surfaces at the front end of each said side frame member for engaging said locking surfaces of said flexure latches to latch and secure said side frame members to said base members;

resilient location urging means positioned between said base member and each of said side frame members, urging and maintaining each of said front locking surfaces into secure engagement with said locking surfaces of said flexure latches;

first and second locating receptacles, having at least a top wall and rear wall, each one adapted to receive, position and secure the rear end of each of said side frame members;

said flexure latches and said front lock means of said side members, each including complementary angled surfaces which allow said side frame members to be press fit into the position of secure engagement with said base member by restricting movement of said side frame members by the co-action between said locating receptacles and said flexure latches;

the distance from the rear end of each of said side frame members to the extremity of said angled surface of said respective side frame member being greater than the distance between the rear wall of said locating receptacle and the locking surface of said flexure latch, creating a front to back flexural force between each said flexure latch and the respective front end of said side frame member, urging and maintaining each said side frame member against the rear wall of the respective said locating receptacle, increasing the rigidity and precise alignment of the printer frame.

4,616,945

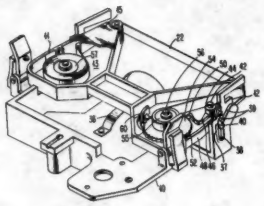
CORRECTION FEED MECHANISM IN A CORRECTION TAPE CARTRIDGE

Steven R. Komplin, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 31, 1985, Ser. No. 696,689

Int. Cl.[4] B41J *29/36, 33/18*

U.S. Cl. 400—697.1 **5 Claims**



1. A tape cartridge for a typewriter using a print ribbon cartridge and including means for mounting the tape cartridge with said ribbon cartridge, said typewriter including a means for carrying a ribbon feed means and ribbon and tape cartridges thereon, including means for pivoting said ribbon cartridge and said tape cartridge to present ribbon and tape at a point for printing, said tape cartridge comprising in combination:

means defining an upper and lower surface spaced apart to define a chamber therebetween to embrace a supply spool and takeup spool and tape between said upper and lower surfaces; a tape supply and a tape takeup spool in said chamber; means for permitting said tape to leave said tape cartridge immediate said supply and said takeup spools for presenting said tape to a print point for utilization; tape drive means coupled to said tape and associated with said takeup spool to effect tape movement between said supply and said takeup spools; and cam follower means projecting outwardly from said chamber and from said correction tape drive means for engagement with a cam on said means for carrying so that upon pivoting of said correction cartridge from at least the level of presentation of said tape to said print point to a lower position, said cam follower means follows said cam to effect tape feed.

4,616,946

PRINTING DEVICE HAVING EXTERNAL DATA INPUT

Mitsuru Murata, Shizuoka; Toyohiro Kobayashi, Yaizu; Shoji Mochizuki, and Masamichi Kawashima, both of Shizuoka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 11, 1984, Ser. No. 680,499

Claims priority, application Japan, Apr. 27, 1984, 59-85519; Jun. 1, 1984, 59-112791

Int. Cl.[4] B41J *5/30, 3/42*

U.S. Cl. 400—704 **8 Claims**

1. A printing device functioning as both a typewriter and a printer, comprising:

a printing device body;

manual print data input means on said body;

memory means in said body;

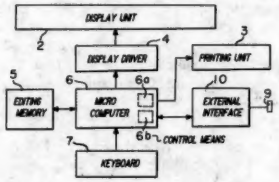
printing means on said body;

microcomputer control means in said body and operatively connected to said data input means, said memory means and said printing means for controlling the operation thereof;

an external data connector at an outer surface of said body

and operatively connected to said microcomputer control means;

checking operation control means in said microprocessor control means and operatively connected to said external data connector for processing checking program data inputted from said external data connector;



an external interface between said external data connector and said microcomputer control mens; and

discriminating means in said microprocessor control means for discriminating whether external data from said external data connector is checking program data.

4,616,947

SLIDE TYPE COSMETIC CONTAINER WITH COMPOUND SCREW

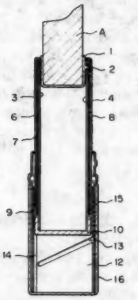
Hisao Iwamoto; Hiroyuki Kimura, both of Odawara, and Yoichi Iwamoto, Funabashi, all of Japan, assignors to Kanebo Limited, Tokyo, Japan

Filed Aug. 24, 1984, Ser. No. 643,987

Claims priority, application Japan, Aug. 25, 1983, 58-131852[U]

Int. Cl.⁴ A45D *40/06, 40/04*

U.S. Cl. 401—69 **6 Claims**



1. A slide type cosmetic stick vessel comprising a middle saucer for holding a cosmetic stick, which has an engaging projection formed on the outer wall thereof, a body cylinder having a longitudinal guide groove through which the engaging projection slides, a threaded cylinder fitted on the periphery of the body cylinder, said threaded cylinder having a right-hand flight groove with which the engaging projection is engaged, a cover cylinder in which the threaded cylinder is inserted and secured, said cover cylinder having a second engaging projection formed on the outer wall of the lower portion thereof, a slide cylinder secured to the outer wall of the lower end of the body cylinder, said slide cylinder having a rotation-stopping piece formed on the outer wall thereof, an insert cylinder fitted to the periphery of the lower portion of the cover cylinder, said insert cylinder having a left-hand flight groove with which the second engaging projection is engaged and a longitudinal engaging groove with which the rotation-stopping piece is slidably engaged, and a middle cylinder in which the insert cylinder is inserted and secured, wherein the middle saucer and the slide cylinder are slidable in the longitudinal direction.

4,616,948

HYDRAULIC FRICTIONAL COUPLING

Stewart D. Jelfs, 3 Northwick Rd., Worchester, England

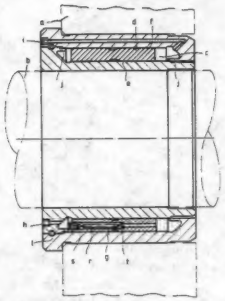
PCT No. PCT/GB84/00148, § 371 Date Jan. 4, 1985, § 102(e) Date Jan. 4, 1985, PCT Pub. No. WO84/04367, PCT Pub. Date Nov. 8, 1984

PCT Filed May 2, 1984, Ser. No. 690,485

Claims priority, application United Kingdom, May 5, 1983, 83 12373

Int. Cl.⁴ F16B *2/04*

U.S. Cl. 403—5 **7 Claims**



1. A coupling for frictionally joining and locking two components for simultaneous angular and axial movement, comprising:

first and second concentric annular members connected by liquid-tight seals;

at least one annular chamber defined by corresponding surfaces of said annular members;

at least one captive annular piston housed within said chamber, said chamber and said piston having matching axially extending, conically tapered surfaces;

injection means for selectively supplying hydraulic fluid under pressure to opposite ends of said piston and selectively causing radial expansion and contraction of said chamber by axial displacement of said piston.

4,616,949

STEERING KNUCKLE FOR A VELOCIPEDE

Andrew Kellner, 92 Cardigan Street, Stanmore, New South Wales, 2048, Australia

Filed Sep. 25, 1984, Ser. No. 654,160

Claims priority, application Australia, Dec. 13, 1983, PG2825

Int. Cl.⁴ F16B *7/10, 11/00*

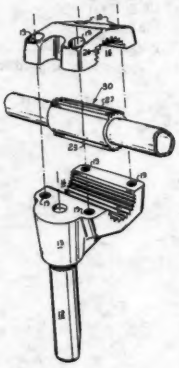
U.S. Cl. 403—104 **7 Claims**

1. A combination handle bar assembly for a velocipede and a knuckle joint for securing a handle bar of said assembly to a steering shaft of the velocipede, said assembly comprising a tubular handle bar having a generally longitudinally extending central portion with surface deformations, said deformations extending inwardly of the handle bar, said combination further comprising:

a. a connection sleeve extending longitudinally around said handle bar so as to surround said central portion, said sleeve being formed of plastic material molded about said handle bar so as to extend into said deformations and so as to comprise means for preventing rotation of the sleeve about the handle bar, said sleeve having longitudinally extending ribs which extend generally radially relative to said handle bar;

b. a first knuckle part to be fixed to said steering shaft, said first knuckle part having a recess;

c. a second knuckle part having a recess, said second knuckle part being adapted to be fixed to said first knuckle part so that the recesses of said knuckle parts cooperate to provide a passage within which said handle bar and said sleeve are located, at least one of said knuckle parts having



a plurality of longitudinally extending channels which receive said ribs to prevent rotation of said sleeve, and said handle bar fixed thereto, about the longitudinal axes of said sleeve and said handle bar relative to said knuckle parts; and

d. means for clamping said knuckle parts together so that said handle bar and said sleeve are clampingly fixed between said knuckle parts.

4,616,950

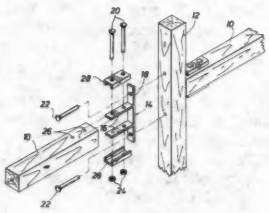
TIMBER JOINING DEVICES

Tom C. Morris, 10416 Wood Dale, Dallas, Tex. 75228

Filed Jan. 31, 1984, Ser. No. 575,690

Int. Cl.[4] F16B *7/04, 39/10*

U.S. Cl. 403—231 **18 Claims**



1. Means for joining the end of a timber having a longitudinal axis to at least one second member, comprising:

a support frame having two support arms which are adapted to lie along opposite sides of said timber and generally along said timber longitudinal axis, said arms adapted to be fastened to said timber with at least one support fastener, at least one frame end fastened to said two support arms and adapted to be fastened to said at least one second member, and

a shallow U-shaped channel positioned around each support arm and having an open side and a back side, said open side providing a trough which is slightly deeper than the thickness of the surrounded support arm and the trough generally abutting the edges of the surrounded support arm, each channel adapted to be fastened to said timber with said at least one support fastener with its open side toward said timber.

4,616,951

COUPLING

Pentti I. Maatela, Kungsgatan 4, S-223 50 Lund, Sweden

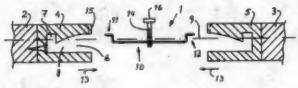
PCT No. PCT/SE82/00435, § 371 Date Aug. 19, 1983, § 102(e) Date Aug. 19, 1983, PCT Pub. No. WO83/02297, PCT Pub. Date Jul. 7, 1983

PCT Filed Dec. 21, 1982, Ser. No. 532,024

Claims priority, application Sweden, Dec. 21, 1981, 8107657

Int. Cl.[4] F16B *2/24*

U.S. Cl. 403—290 **4 Claims**



1. Coupling for interconnecting two elements along a connection line comprising a spring member adapted to engage a profile member of each element, characterized in that

a. each profile member (**4, 5**) is attached to or is an integral portion of the corresponding element (**2, 3**);

b. each profile member has at least one substantially L-shaped opening or recess (**6**), each of said recesses having a first leg portion (**7**) which extends perpendicular to the connection line (**9**) and a second leg portion coincident with the connecting line (**9**);

c. the spring member (**10**) is hat-shaped, each edge portion of which includes a first portion (**17**) extending substantially perpendicular to the base surface (**19**) of the spring member and a second portion (**18**) extending substantially parallel to but offset in relation to the base surface;

d. the spring member further comprising a biasing member (**14**) adjacent its middle portion adapted to bend the base surface of the spring member;

e. the first and second portions (**17, 18**) of the edge of the spring member being bent relative to the base surface to be received in the first leg portion (**7**) of the L-shaped opening of the profile member, whereby the outer edge of the second portion (**18**) of the spring member is firmly pressed against a surface (**21**) of the first leg portion of the profile member at the tightening of the biasing member.

4,616,952

SHAFT COUPLING LOCKABLE IN THE RELEASED POSITION

Wilhelm Schott, Hennef/Sieg, Fed. Rep. of Germany, assignor to Jean Walterscheid GmbH, Lohmar/Rhld., Fed. Rep. of Germany

Filed Jan. 6, 1986, Ser. No. 816,459

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1985, 3501262

Int. Cl.[4] F16B *7/00*

U.S. Cl. 403—316 **2 Claims**

1. A shaft coupling lockable in a released position for releasably coupling two shaft members particularly for connecting an agricultural implement with a tractor, comprising:

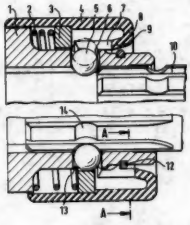
a coupling sleeve having radial openings therein and an attachment side;

a power takeoff shaft having an annular groove therein adapted to be connected with said coupling sleeve from said attachment side;

a plurality of locking bodies guided in said radial openings of said coupling sleeve engaging within said annular groove to axially retain said coupling sleeve and said power takeoff shaft connected;

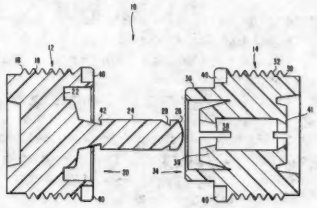
a lock ring axially movable on said coupling sleeve between a locking position holding said locking bodies in engagement within said annular groove and a released position

enabling said coupling sleeve to be released from said power takeoff shaft;
spring means urging said lock ring toward said locking position;
a gripping sleeve axially fixed with said lock ring but rotatable relative thereto extending about said coupling sleeve;
a radially inwardly extending projection on said gripping sleeve located on an end thereof facing said attachment side of said coupling sleeve;
an annular part on said coupling sleeve extending from said projection axially inwardly of said gripping sleeve;



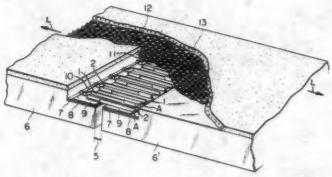
a radially inwardly directed hooked projection provided at an inner end of said annular part; and
a plurality of longitudinally extending slots uniformly circumferentially distributed on said annular part dividing said annular part and said hooked projection thereon into a plurality of individual radially inwardly extending locking brackets, each having a circumferential width which is smaller than the circumferential size of said radial openings;
the quantity of said locking brackets being divisible by the quantity of said radial openings.

4,616,953
KNOCK DOWN PIVOT FASTENER
Daniel Gomes, P.O. Box 117, Worcester, N.Y. 12197
Filed Sep. 27, 1985, Ser. No. 781,030
Int. Cl.[4] B25G *3/00*; F16D *1/00*
U.S. Cl. 403—407.1 **20 Claims**



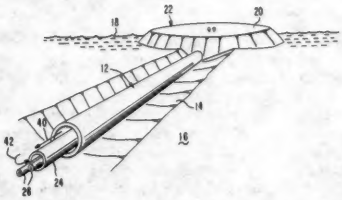
1. A pivot fastener useful in coupling a first part to a second part, comprising:
a first bushing member having an outer surface with means for securing said first bushing member in fixed relationship to a first part, said first bushing member also having a mating face including a circumferential locking sleeve and an axially extending bearing post member with a bearing surface and a first circumferential retaining flange; and,
a second bushing member having an outer surface with means for securing said second bushing member in fixed relationship to a second part, said second bushing member also having a mating face including a circumferential locking collar sized to fit and engage within the locking sleeve and an axially-extending opening for receiving the bearing end of the bearing post member therethrough, the opening having a mating bearing surface and a reduced diameter portion for engaging the first retaining flange in a snap-fit relationship for preventing separation of said first and second bushing members when the bearing post member is received therein and the locking collar is positioned within the locking sleeve while also permitting relative rotation therebetween.

4,616,954
CONTINUOUS PAVEMENT PROCESS FOR A BRIDGE SURFACE EXPANSION JOINT
Kazumitsu Taga, Kawasaki, Japan, assignor to Japan Constec Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 30, 1984, Ser. No. 677,679
Claims priority, application Japan, Jul. 30, 1984, 59-157677
Int. Cl.[4] E01C *11/02*
U.S. Cl. 404—74 **4 Claims**



1. A process for constructing a continuous pavement on a bridge surface, comprising the steps of:
arraying a pluality of bridging metals so that U-shaped members thereof are positioned with bent pieces thereof alternately overlapping in a hollow space provided between adjacent floor slabs of a bridge;
securing fixedly base end portions of alternate ones of the arrayed bridging metals to a corresponding one of the adjacent floor slabs;
filling the hollow space with an asphalt mixture; and
depositing subsequently a continuous asphalt mixture surface layer over the asphalt mixture and over the floor slabs;
whereby the floor slabs are freely slidable toward and away from each other under the continuous asphalt mixture surface layer.

4,616,955
METHOD AND APPARATUS FOR ENCASING PIPELINE OR CABLE
Norman R. Wallace, Walnut Creek, and Edgerton G. Jones, San Francisco, both of Calif., assignors to Bechtel International Corporation, San Francisco, Calif.
Filed Oct. 18, 1984, Ser. No. 661,855
Int. Cl.[4] F16L *1/00*
U.S. Cl. 405—158 **17 Claims**



1. A method for encasing an elongated pipe member in a tubular support comprising:
laying the support on a surface;
filling the support with a liquid;

selecting the diameter and wall thickness of the pipe member so that said pipe member has a buoyancy substantially neutral with respect to the liquid; and

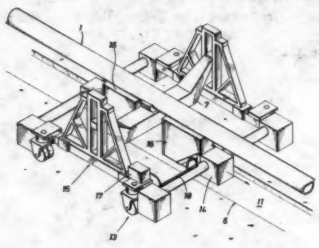
floating the pipe member into the support from one end of the support.

4,616,956

PIPELINE LAUNCHING MODULE

Dean P. Hemphill, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 8, 1984, Ser. No. 618,298
Int. Cl.[4] F16L *1/04*
U.S. Cl. 405—158 10 Claims



1. A method for deploying an object through an ice slot into underlying water, comprising:

supporting the object with at least one module which straddles the ice slot;

reducing the loading on the sides of the ice slot by deploying flotation from the module through the ice slot and into the water; and

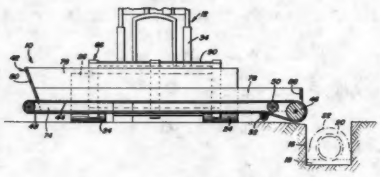
providing auxiliary reserve buoyancy flotation, substantially submersible only during a failure of the ice surrounding the ice slot and functionable to float the module.

4,616,957

PIPELINE PADDING MACHINE

Larry N. Burrows, Rte. 7, Box 1542-C, and Truman L. Gregory, Box 6605, both of Odessa, Tex. 79762

Filed Jun. 8, 1984, Ser. No. 619,311
Int. Cl.[4] E02F *5/22*; F16L *1/02, 57/00*
U.S. Cl. 405—179 2 Claims



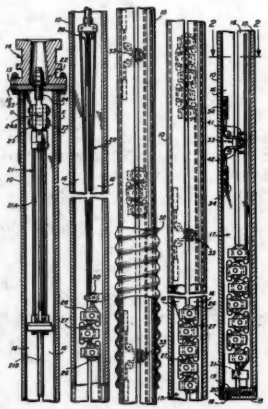
1. A machine for transfering padding material from a dump truck body into a pipe line ditch comprising an elongated, horizontally disposed, upwardly opening chute for receiving padding material from the dump truck body, an endless, imperforate, flexible conveyor belt forming the bottom of said cute, said chute including an end wall spaced a predetermined distance above the belt to form a slot-like outlet above the belt, a pair of end rollers supporting said belt for discharge of padding material into a ditch with the thickness of the padding material being discharged determined by the space between the end wall and the conveyor belt and remaining substantially constant as padding material is discharged into the ditch, means driving one of said end rollers, means mounting the chute, belt and rollers from a vehicle such that as the vehicle travels parallel to a pipeline ditch, padding material will be discharged into the ditch, said means supporting the chute, belt and rollers from a vehicle includes a supporting frame structure of inverted U-shaped configuration for vertically positioning on a bulldozer blade attached to the vehicle without modification of the bulldozer blade and without manipulation of fastening devices, said chute including an upwardly inclined rear wall being inclined toward the frame structures, an upwardly inclined front wall of less height that the rear wall thereby enabling the rear end of a dump truck body to be positioned over the front wall of the chute for discharging padding material into the chute without contacting the front wall.

4,616,958

RETRACTION ASSEMBLIES FOR EXPANSIBLE MANDRELS

Nicholas H. Werthessen, Cranston, R.I., assignor to Fru-Con Construction Corporation, Ballwin, Mo.

Filed Nov. 13, 1984, Ser. No. 670,915
Int. Cl.[4] E02B *17/00*
U.S. Cl. 405—246 12 Claims



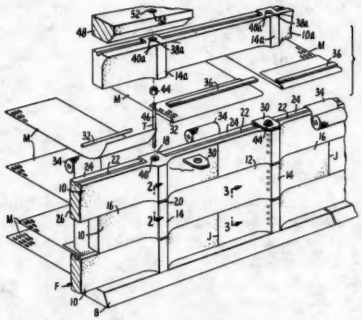
1. An expansible mandrel for use in driving or withdrawing tubular piles and the like, said mandrel comprising two sections, head structure joining the upper ends of said sections, said sections shaped and dimensioned for movement towards and away from each other between pile-entering and pile-gripping relationships, fluid pressure operated means within said mandrel operable to apply expanding force against said sections in a plurality of zones spaced lengthwise of the mandrel thereby to effect said pile-gripping relationship, and resilient means yieldably opposing expanding forces and operable to reestablish said pile-entering relationship when said fluid pressure operated means is not in service, said resilient means including a series of assemblies spaced lengthwise of said mandrel, each assembly between an adjacent pair of zones, each assembly including a coil spring extending lengthwise of one section, means connected to said one section and backing one end of said spring, anchoring means spaced from said backing means lengthwise of said one section and connected to said one section, a pair of guides between said backing and anchoring means, said guides connected to said one section and spaced lengthwise from each other, a retraction cleat connected to said other mandrel section opposite the space between said guides and a connection between the other end of said spring and said anchoring means and including a flexible portion in trained engagement with said guides and said cleat and holding said spring compressed.

4,616,959

SEAWALL USING EARTH REINFORCING MATS

William K. Hilfiker, Eureka, Calif., assignor to Hilfiker Pipe Co., Eureka, Calif.

Filed Mar. 25, 1985, Ser. No. 715,929
Int. Cl.[4] E02D 5/00, 29/02
U.S. Cl. 405—286 7 Claims



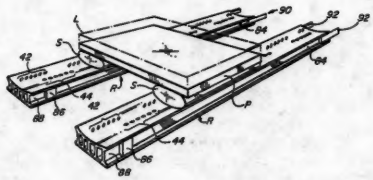
1. A wall for retaining and protecting the face of an earthen formation, said wall comprising: paired face panels stacked upon one another at the face of the formation, said paired panels having back surfaces in apposition to the formation, mutually engageable stacking columns at spaced locations along the length thereof, and surfaces opposed to one another intermediate said columns; a longitudinally extending groove formed in the opposed surface of at least one of said paired panels in spaced relationship to the back surface thereof; a recessed step formed in the opposed surface of at least one of said paired panels, said step being uninterrupted and co-extensive with said groove, said step extending to the back surface of the panel within which it is formed and communicating with and having a depth less than the groove; a soil reinforcing mat embedded within the formation, said mat having a distal portion extending over the recessed step and secured to an enlarged anchor captured between said groove and the opposed surface of the panel in opposition thereto; and seal means within the step engaged with the mat to restrict the intrusion of water through the wall and into the formation.

4,616,960

AIR CONVEYOR COMPONENTS

Herbert E. Gladish, Ottawa, Canada, assignor to E. B. Eddy Forest Products Ltd., Ottawa, Canada

Filed Oct. 20, 1983, Ser. No. 543,976
Claims priority, application Canada, Jun. 30, 1983, 431,658
Int. Cl.[4] B65G 51/03
U.S. Cl. 406—88 18 Claims



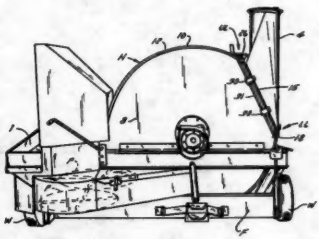
1. An improved rail for use in mono- or multi-rail fluid-pressure supported article transportation systems comprising a shallowly transversely concave upper wall member, a pair of generally vertical, longitudinally extending side walls, each wall being inset from a corresponding edge of said upper wall member, a generally planar lower wall member extending transversely outwardly beyond each side wall, partition wall means extending between said upper and lower wall members so as to define at least two longitudinally extending ports within said rail, a plurality of nozzles communicating through the upper wall member with said ports, the nozzles being longitudinally aligned in groups such that there is a space between longitudinally adjacent groups for each of said ports and such that each group associated with one port is positioned generally laterally opposite a space between adjacent groups associated with the other of said ports, each nozzle being angled with respect to a longitudinally extending plane which is tangent to the outer curved surface of the upper wall member where the axis of the nozzle intersects the outer surface, the nozzles of each group being directed generally towards the edge of said rail closest thereto.

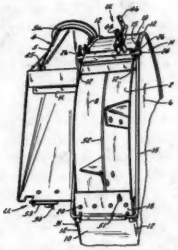
4,616,961

FORAGE BLOWER HAVING A REMOVABLE OUTLET TRANSITION MEMBER

Donald E. Burrough, West Bend, and Kim P. Viesselmann, Grafton, both of Wis., assignors to Gehl Company, West Bend, Wis.

Filed Jul. 5, 1984, Ser. No. 627,786
Int. Cl.[4] B65G 53/58
U.S. Cl. 406—99 12 Claims





1. A forage blower having a vertical positioned blower housing of generally circular shape when viewed in elevation and which has a blower outlet opening adjacent its upper portion, said forage blower also having a blower outlet transition member having one position wherein it is extending generally tangentially upwardly from and in communication with said blower outlet opening, said housing comprising;

a pair of generally circular and laterally spaced apart side sheets, an annular peripheral rim sheet mounted around the periphery of said side sheets and having spaced apart opposed ends located adjacent to said blower outlet opening and defining the peripheral limits of said blower outlet opening,

clamping means connected between said spaced apart ends of said rim sheet for clamping said rim sheet around said

side sheets, said adjustable clamping means comprising at least one rod positioned along one of said side sheets and arranged at an inclined angle from the vertical to define a pivot axis, and hinge means connected between said rod and said blower outlet transition member for enabling swingable positioning of said blower outlet transition member between said one position and another position along one of said side sheets about said pivot axis whereby said blower outlet transition member can be swung laterally to one side of said housing to expose said blower outlet opening for access to the interior of said housing.

4,616,962

CUTTER INSERT

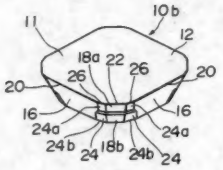
Hiroyuki Ushijima, Yokohama; Hiroshi Shimomura, and Masaaki Nakayama, both of Tokyo, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1985, Ser. No. 724,665

Claims priority, application Japan, Apr. 28, 1984, 59-63810[U]

Int. Cl.⁴ B23B *27/22;* **B26D** *1/00;* **B23C** *5/20*

U.S. Cl. 407—113 **4 Claims**



1. An indexable cutter insert for a rotary cutter comprising a generally polygonal plate defined by a front face, a rear face and a plurality of side faces, the corner portions of said plate where adjacent side faces intersect one another being removed to provide respective corner faces, said plate having a plurality of main cutting edges each defined by said front face and a respective one of said side faces and a plurality of auxiliary cutting edges each defined by said front face and a respective one of said corner faces, each side face seving as a relief surface of a respective one of said main cutting edges, a forward portion of each corner face remote from said rear face serving as a relief surface of a respective one of said auxiliary cutting edges, a rearward portion of each corner face remote from said front face being offset inwardly from said forward portion to provide a clearance surface, each corner face having a connective surface interconnecting said forward and rearward portions and sloping inwardly from said forward portion toward said rearward portion, and said clearance surface extending from said rear face to a plane generally centrally of the thickness of said plate.

4,616,963

CUTTING TIP FOR CUTTING-TOOLS

Guy Habert, Every, France, and Harald Kraft, Uhingen, Fed. Rep. of Germany, assignors to Feldmuhle Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

PCT No. PCT/DE82/00145, § 371 Date Feb. 24, 1983, § 102(e) Date Feb. 24, 1983, PCT Pub. No. WO83/00109, PCT Pub. Date Jan. 20, 1983

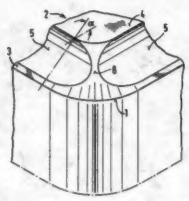
PCT Filed Jul. 9, 1982, Ser. No. 474,573

Claims priority, application France, Jul. 10, 1981, 81 13690

Int. Cl.⁴ B23B *27/22;* **B26D** *1/00*

U.S. Cl. 407—114 **10 Claims**

1. In a cutting tip for cutting tools having top and bearing surfaces, and side surfaces extending between said top and bearing surfaces, and having an encircling cutting edge defined by a bevel and a shaping stage for the chip, the improvement which comprises the bevel (3) running at an angle (α) of from 15 to ±degrees with respect to the top (4) or bearing surface and having a width of from 0.05 to 0.4 mm, wherein said bevel (3) intersects said said surface and is sloped so that said bevel (3) is inclined upwardly from the point of intersection with said side surface toward said top surface (4) and having next adjacent to this bevel, a channel (5) which intersects said bevel (3)



and has a cross-section in the form of a segment of a circle, the longest chord (6) of which runs at an angle (β) of from 15 to 35 degrees with respect to the top (4) or bearing surface, wherein said chord (6) is sloped so that said chord (6) is inclined upwardly from the point of intersection with said bevel (3) toward said top surface (4).

4,616,964

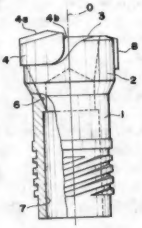
CARBIDE DRILL

Takuji Nomura, 12-64, Takakuracho, Nishinomiya, Hyogo, Japan

Filed Jun. 13, 1983, Ser. No. 503,481

Int. Cl.⁴ B23B *51/02*

U.S. Cl. 408—144 **5 Claims**



1. A carbide drill comprising: means forming a nonmachining zone at one end thereof about the axis of rotation including at least one tip mounted radially along a radial line from the axis of rotation with a clearance and with the cutting edge of the tip offset forward of the radial line such that the distance from the axis of rotation to the cutting edge is greater than the distance from the axis of rotation to the end face of the tip and at least one arris on the end face of the tip facing the nonmachining zone to form a noncutting edge thereon.

4,616,965

INDEXABLE SHELL CUTTER

Russell W. Anderson, Milwaukie, and Michael J. Held, Portland, both of Oreg., assignors to Manufacturers Tool Service, Inc., Portland, Oreg.

Filed Feb. 27, 1984, Ser. No. 583,712

Int. Cl.⁴ B23B *27/10*

U.S. Cl. 408—204 **4 Claims**

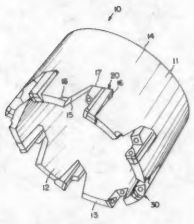
1. A rotary cutting tool comprising:

(a) a cylindrical cutting head having a circular cutting face;

(b) a plurality of axial recesses formed in the outer periphery of said cutting head and extending rearwardly from said cutting face, said recesses being equidistantly spaced around the periphery of said cutting face, each of said

recesses being formed by a first surface, a second surface spaced from said first surface a predetermined distance, and a base surface extending between said first and second surfaces at an acute angle to said second surface, said second surface being substantially perpendicular to the plane of the cutting face and V-shaped in cross-section;

(c) a cartridge releasably secured in each of said recesses, each said cartridge having a V-shaped base in mating relationship with the second surface of each of said recesses, an upper face opposite said base, an inner end mat-



ingly engaging the base surface of said recess, and an outer end opposite to said inner end; and

(d) a replaceable cutter insert having three cutting edges, each in the shape of an elongated V, indexably secured to the outer end of each of said cartridges with the outer face of said insert being substantially perpendicular to the plane passing through the cutting face of said cutting head, a first of said cutting edges extending beyond the outer end of said cartridge a distance sufficient to engage a workpiece, the outer end of said cartridge being similar in shape to said cutting edges.

4,616,966

METHOD FOR CHAMFERING

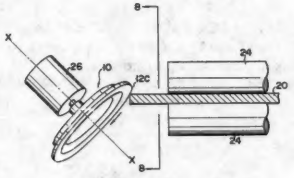
Iwane Ohyama, Kamakura, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation-in-part of Ser. No. 370,101, Apr. 20, 1982, abandoned, which is a continuation of Ser. No. 163,477, Jun. 27, 1980, abandoned. This application Oct. 11, 1983, Ser. No. 540,686

Claims priority, application Japan, Jul. 3, 1979, 54-83465; Apr. 30, 1980, 55-57504

Int. Cl.[4] B23C *3/12*

U.S. Cl. 409—132 **2 Claims**



1. A method of chamfering an edge of a plate-like workpiece, especially a workpiece made of a silicon steel plate, comprising the steps of:

providing a rotating circular cutter having a ring-shaped cutting edge portion formed along a periphery of a holder therefor, the cutting edge portion having an edge tip defining a circle, said edge tip having a rake angle within the range of 0 to −1.0 degrees and a relief angle whch has a zero or positive value;

orienting the cutter to the workpiece so that the edge of the workpiece to be chamfered engages the edge tip at only one portion of the circle as the workpiece moves with respect to the cutter to engage various portions of the edge to be chamfered, this step of orienting including establishing positional relationships such that:

(a) the angle formed between an upper surface of the workpiece and a working plane of the cutter, which plane includes a circle defined by the edge top of the cutting edge portion of the cutter, falls within the range of 0° to 45°,

(b) the plane including the upper surface of the workpiece crosses at two points with said circle defined by the edge top of the cutting edge portion of the cutter,

(c) the working plane of the cutter is inclined relative to the edge of the workpiece to be chamfered such that the working plane crosses with the edge of the workpiece at only the front portion of the cutter working plane in a moving direction of the workpiece so as to allow the edge of the workpiece to be chamfered only at the single cross point thereby formed, and

(d) rotation of the circular cutter is permitted such that, for a projection of the cutter onto the upper surface of the workpiece, the edge tip of the cutting edge portion of the cutter is moved at the cross point from an overlapping region between the projection of the cutting and the workpiece to a non-overlapping region thereof;

rotating the cutter; and

moving the workpiece in a direction of a sense opposite to that of movement of the cutting edge portion of the cutter at the cross point so that successive portions of the edge to be chamfered engage the cross point thereby chamfering the edge at the cross point.

4,616,967

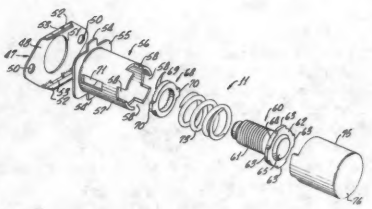
PANEL FASTENER

Jorge W. Molina, Torrance, Calif., assignor to Deutsch Fastener Corp., El Segundo, Calif.

Filed Aug. 29, 1983, Ser. No. 527,229

Int. Cl.[4] F16B *39/00, 41/00*

U.S. Cl. 411—105 **3 Claims**



1. A fastener comprising nut means for attachment to a first workpiece, and stud means for attachment to a second workpiece for mating with said nut means for holding said first and second workpieces together, said stud means including

a housing having a tubular portion, an open end, an end opposite said open end, and a base at said open end, said tubular portion further including a pair of slots, means engaging said base for holding said housing to a workpiece with freedom for limited lateral floating movement while precluding substantial rotation of said housing relative to such a workpiece,

a stud having a head at one end and a threaded shank projecting from said head,

said stud being received in said housing with said shank extending toward said open end thereof,

said housing and said stud having interengaged means for holding said stud in said housing,

a washer around said shank,

said washer and said tubular portion of said shank having interengaged means for preventing substantial rotation of said washer relative to said housing while permitting

limited axial movement of said washer relative to said housing,

said washer having teeth thereon facing said open end of said housing,

a compression spring biasing said washer outwardly toward said open end,

said nut means having teeth on the outer end thereof for engagement with said teeth of said washer for providing a resistance to said rotational movement between said nut means and said washer, and

a cover member,

said cover member including an end wall and a tubular wall,

said end wall being positioned over said opposite end of said housing and said tubular wall receiving said tubular portion of said housing,

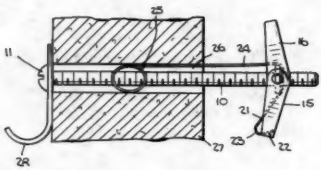
said tubular wall of said cover member having an inwardly delected dimple received in one of said slots in said tubular portion of said housing for thereby holding said cover member to said housing.

4,616,968

NON-ROTATING TOGGLE BOLT ASSEMBLY

Louis N. Giannuzzi, 4 Shelter Dr., Cos Cob, Conn. 06807

Filed Jul. 27, 1984, Ser. No. 635,068
Int. Cl.[4] F16B *21/00*
U.S. Cl. 411—342 **9 Claims**



1. A non-rotating toggle bolt assembly for supporting a fixture or other object against the outer surface of a hollow wall, said assembly comprising:

A. a screw having a head engageable by a screw driver or other tool to effect turning, and a threaded shank whose length exceeds the thickness of the wall for which it is intended;

B. a nut threadably received on the shank and provided with oppositely-extending lugs forming trunnions;

C. wings pivotally supported on said trunnions and spring-biased to normally maintain the wings in an outstretched state, said wings having an opening therein to admit the shank, said wings in the course of installation folding in toward the shank to permit passage of the assembly in a hole drilled in said wall, the wings when emerging from the hole resuming their outstretched state; and

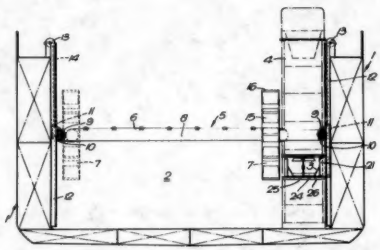
D. locking means to prevent rotation of the outstretched wings, whereby when said screw is turned, the nut and the wings pivoted on said trunnions will then advance along the shank toward the inner surface of the wall to engage said inner surface, said locking means being constituted by a locking member coupled to said nut and the wings pivoted on said trunnions and provided with a long tail which terminates in a restraining element, the length of the long tail substantially exceeding the length of the folded-in wings and being such that in the course of installation when the wings are folded in to pass through the hole, the long tail also passes therethrough but the restraining element does not emerge from the hole when the wings after emerging from the hole resume their outstretched state and the head of the screw then lies against the fixture on the outer surface of the wall whereby the restraining element restrains the long tail, thereby preventing rotation of the nut and the wings pivoted on the trunnions, said locking means being formed of resilient metal wire.

4,616,969

EMPTYING DEVICE FOR BULK MATERIAL

Kaare Haahjem, Haahjem A/S, P.O. Box 25, N-6040 Vigra, Norway

Filed Oct. 5, 1984, Ser. No. 658,384
Claims priority, application Norway, Oct. 26, 1983, 833913
Int. Cl.[4] B65G *65/38*
U.S. Cl. 414—144 **6 Claims**



1. An emptying device for bulk material in cargo or storage room, comprising:

a first horizontal conveyor;

means for raising and lowering said first conveyor along a side of the room, said first conveyor being adapted to move said bulk material in the direction of a lifting conveyor;

a second horizontal conveyor adapted to transport bulk material on the top side thereof towards said first horizontal conveyor, said second conveyor being movable along the latter;

said first horizontal conveyor including means for digging room for said first conveyor in the bulk material as it is lowered; and

said second horizontal conveyor comprising a belt conveyor and at least one excavating wheel rotatable about said belt,

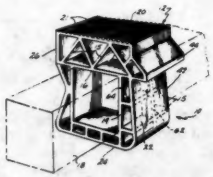
wherein said first horizontal conveyor comprises a longitudinal chute having movable catchers, and wherein said digging means comprieses scrapers which are movable along the bottom side of the chute.

4,616,970

TOW BAR BLOCK AND TOW BAR ASSEMBLY

James L. Lewis, Lake Orion, Mich., assignor to Arthur J. Bott, Grand Rapids, Mich., a part interest

Filed Oct. 12, 1984, Ser. No. 660,067
Int. Cl.[4] B60P *3/06*
U.S. Cl. 414—563 **62 Claims**



1. A tow bar block for supporting a vehicle on a tow bar by engaging support surfaces on said vehicle, said tow bar block comprising:

a central opening therethrough for receiving a tow bar;

a plurality of faces spaced from said central opening and

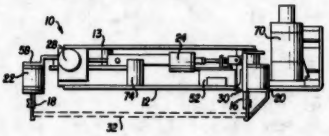
being oriented outwardly therefrom, at least two of said faces having differing configurations adapted to receive differing shapes of support surfaces on different vehicles, whereby a tow bar can be positioned within said opening in said tow bar block and can be employed to tow a vehicle with said block supporting said vehicle, one of said configured faces engaging a support surface on said vehicle; said faces are integrally formed with one another and said faces extend peripheraly around said central support.

4,616,971

ROBOTIC HAND AND METHOD FOR MANIPULATING PRINTED CIRCUIT BOARDS

John L. Matrone, Schenectady, N.Y., assignor to Fairchild Camera and Instrument Corp.

Filed Oct. 11, 1983, Ser. No. 540,415
Int. Cl.[4] B25J *15/10*
U.S. Cl. 414—730 **19 Claims**



1. A robot hand for use in individually picking up, transporting and releasing a variety of loaded circuit boards without impinging upon the circuitry, components and connectors on the boards, each board having first and second opposing edges, comprising:

a palm having a wrist connection site for connection with a wrist of a robot;

a first pincer unit depending from the palm for engaging a first edge of a circuit board;

second and third pincer units, depending from the palm for engaging a second opposing edge of the board, said second and third pincer units lying along a predetermined reference line with which said second edge of the board is aligned by said pincer units;

means for adjusting the relative positions of said second and third pincer along said reference line so that said second and third pincer units selectively engage clear spots along said second edge of the board;

each pincer unit being adapted to pinch and hold its corresponding edge of the circuit board by means of a thumb and finger set, each set defining a pinching gap and each set being operable between a pinching state in which the gap is relatively closed and an open state in which the gap is relatively open, and the configuration of the pincer units and their pinching gaps being such as to hold a board between the units in a spaced-apart relationship with respect to the palm.

4,616,972

APPARATUS FOR LOADING A WHEELCHAIR OR SIMILAR OBJECT

Robert E. McFarland, 8301 NW. 39th Expressway, Bethany, Okla. 73008

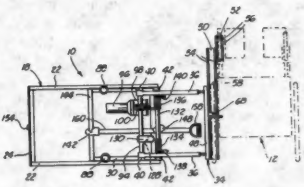
Division of Ser. No. 565,164, Dec. 23, 1983, Pat. No. 4,573,854. This application Oct. 30, 1985, Ser. No. 792,875
Int. Cl.[4] B60R *7/00*
U.S. Cl. 414—749 **13 Claims**

1. In a loading apparatus having a generally horizontally extending chassis defining a plurality of guide tracks, and a carriage having guide rollers guided in rolling contact with each of said tracks, such that said carriage may be alternately rolled from a latched forward position to a latched rearward position on said chassis, the improvement comprising:

a forward latch whereby said carriage is latched to prevent further forward or rearward motion of said carriage on said chassis when said carriage is rolled to said forward position;

a rearward latch whereby said carriage is latched to prevent further rearward or forward motion of said carriage on said chassis when said carriage is rolled to said rearward position; and

unlatching means adjacent said forward and rearward latches and attached to said carriage, said unlatching



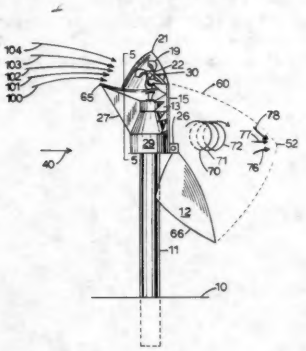
means having a handle whereby, when said carriage is in said latched forward position, moving said handle in one direction will unlatch said forward latch and, upon further movement in said one direction, will cause said carriage to roll in a rearward direction, and, when said carriage is in said latched rearward position, moving said handle in a second direction will unlatch said rearward latch and, upon further movement in said second direction, will cause said carriage to roll in a forward direction.

4,616,973

WIND DRIVEN TURBINE

Nicholas Souchik, Jr., Little Gloucester Rd., Apt. S 37, Blackwood, N.J. 08012

Filed Dec. 31, 1984, Ser. No. 687,778
Int. Cl.[4] F03D *3/04*
U.S. Cl. 415—2 R **8 Claims**



1. In combination:

a pylon support structure provided with means to elevate to minimize ground drag effects in a moving stream, a platform mounted on said support structure provided with means to rotate in any moving stream direction, a frame mounted on said platform provided with means to extend horizontally to the ground from the vertical axis of said pylon support structure,

a shaft elevated horizontal to the ground and perpendicular to the moving stream provided with means to rotate around said shaft axis,

a multiple number of turbines rigidly mounted on said shaft provided with blades with means to transfer kinetic energy of a moving stream to rotational mechanical energy of said shaft,

a rotational mechanical energy utilization device such as a

generator provided with means to do useful work, a power transmission provided with means to transfer power from said shaft to said utilization device and means to change the rotational speed of said shaft to match the rotational speed of said utilization device,

an augmenter rigidly mounted on said frame upstream of said turbines provided with a continuous surface to divert the moving stream and provided with a right circular cone conic section curved leading edge with said curved edge major axis bisects said continuous surface and is oriented perpendicular to the midpoint of said shaft with said leading edge upstream of said edge geometric focus with said focus elevated below said turbines and said major axis angle to the moving stream fixed,

an augmenter rigidly mounted below and downstream of said turbines provided with a continuous surface to divert the moving stream provided with a right circular cone conic section curved trailing edge oriented with curved trailing edge bisecting said surface with a major axis oriented perpendicular to the midpoint of said shaft with said trailing edge geometric focus below said turbines and at a fixed angle to the moving stream,

said augmenter trailing edge is provided with means to add angular momentum to the moving stream oriented with clockwise circulations produced in the portion of the stream passing over the right said trailing edge of said augmenter when viewed from an upstream position and counterclockwise circulations produced in the portion of the stream passing over the left said trailing edge of said augmenter when viewed from an upstream position,

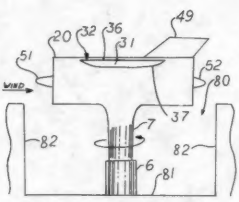
an augmenter mounted by hinge means to said rotational platform downstream of the midpoint of said shaft provided with a continuous surface and a right circular cone conic section curved trailing edge oriented with said curved trailing edge major axis bisecting said surface and oriented perpendicular to the midpoint of said shaft with said trailing edge downstream and below said platform.

4,616,974

WIND DRIVEN POWER GENERATING APPARATUS

Walter Andruszkiw, 31415 Mound Rd., Warren, Mich. 48092, and Roman Andrushkiw, 42400 Malbeck, Sterling Heights, Mich. 48077

Filed Jul. 19, 1985, Ser. No. 756,599
Int. Cl.[4] F03D *7/04*
U.S. Cl. 415—4 **6 Claims**



1. A vertically adjustable wind driven power generating apparatus comprised of, in combination, a well in which is vertically movably mounted a wind driven power generating apparatus comprised of:

(i) a wind driven power generating means comprised of a tubular housing having rotatably mounted therein a horizontally extending shaft having a centrally disposed bevel gear fixedly attached thereto and a plurality of helical vanes disposed longitudinally on both sides of said bevel gear;

(ii) means for vertical movement of said tubular housing within said well comprised of (a) a hollow vertical support column having a circular cross section and having one end thereof attached to the bottom of said tubular housing and (b) a vertically extending hollow tubular member having a hollow interior fixedly mounted at its bottom end in the floor of said well and being open at its other end, said tubular member adapted to telescopically receive said vertical support column in its open end;

(iii) vertical movement control means comprised of (a) downward movement control means comprising an inverted wing system generating inverse-lift mounted on said tubular housing, and (b) upward movement control means comprising a cylinder having an axially movable piston therein, said piston defining an enclosed cavity within said cylinder which contains a compressible gas and a second cavity containing a hydraulic fluid and being in communication with the hollow interior of said vertically extending tubular member; and

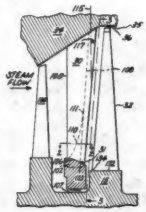
(iv) power transmission means comprising a vertically extending power transmitting shaft rotatably mounted in said hollow vertical support column, said power transmitting shaft having a top end extending into said tubular housing and having fixedly mounted at said top end a bevel gear which is in meshed contact with said bevel gear of said horizontally extending shaft disposed in said tubular housing and a bottom end which is connected to and drives a power generator.

4,616,975

DIAPHRAGM FOR A STEAM TURBINE

Dan Duncan, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 30, 1984, Ser. No. 635,948
Int. Cl.[4] T01D *5/10*
U.S. Cl. 415—181 **11 Claims**



1. A diaphragm of an axial flow turbine, said turbine including a rotor and energy extracting means coupled to said rotor for converting at least a portion of energy available from an elastic fluid into mechanical energy, said diaphragm for circumferential disposition around the rotor for directing said elastic fluid into said energy extracting means, comprising:

a plurality of spaced apart nozzle partitions forming a respective plurality of channels therebetween; and

an inner member for fixedly securing said plurality of nozzle partitions, each of said plurality of nozzle partitions having a root portion proximate the inner member and including a leading edge and a trailing edge and disposed to include both an axial lean and a tangential lean of the trailing edge, each of said axial lean and said tangential lean with respect to a radial reference from the axis of rotation of the rotor, said inner member including a greater outward radial extent proximate the leading edge of the nozzle partitions than the outward radial extent proximate the trailing edge of the nozzle partitions;

each of said plurality of nozzle partitions spaced from an adjacent nozzle partition such that the channel therebetween includes a minimum throat and a trailing edge throat, wherein the minimum throat is disposed between the leading edge of the nozzle partition and the trailing edge throat at the root of the nozzle partition and the minimum throat is disposed monotonically more proximate the trailing edge throat of the nozzle partition at increasing radial distance from the root of said nozzle

partition, whereby the margins of the channel define a converging-diverging passageway at least over a portion of the radial extent of the channel.

4,616,976

COOLED VANE OR BLADE FOR A GAS TURBINE ENGINE

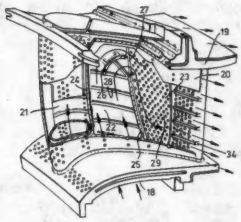
Barry W. Lings, Spondon, and John H. Nicholson, Mickleover, both of England, assignors to Rolls-Royce plc, London, England

Filed Jun. 28, 1982, Ser. No. 397,412

Claims priority, application United Kingdom, Jul. 7, 1981, 8120939

Int. Cl.[4] B63H *1/14*

U.S. Cl. 416—97 R **5 Claims**



1. A cooled vane or aerofoil for a gas turbine engine comprising:

an aerofoil with a leading edge and a trailing edge and having a hollow interior defined by a concave pressure flank and an opposed unapertured convex suction flank;

partition means extending spanwise in said hollow interior of said aerofoil and dividing a trailing edge compartment from a remainder of said hollow interior;

means for supplying cooling air to said trailing edge compartment, said means including at least one aperture;

a thin perforated impingement plate extending spanwise and chordwise in said trailing edge compartment, said impingement plate being spaced from an inner surface of said unapertured convex suction flank and from an inner surface of said concave pressure flank;

means for loosely holding said perforated impingement plate in position when said vane is inoperative, said means including spanwise spaced and chordwise extending ribs in said trailing edge compartment, said ribs projecting from said inner surface of said unapertured convex suction flank, a plurality of discrete projections in said trailing edge compartment, said discrete projections extending from said inner surface of said concave pressure flank, a spanwise extending sealing rib positioned adjacent said partition means and a further spanwise extending rib positioned adjacent said trailing edge;

an array of film cooling holes in said concave flank providing communication between said trailing edge compartment and an exterior of said aerofoil;

and at least one air ejection hole in said trailing edge of said aerofoil and communicating with a space defined between said inner surface of said suction flank and said impingement plate.

4,616,977

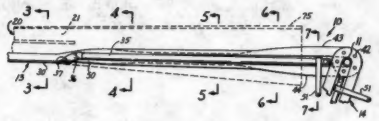
HUBLESS, HINGELESS AND BEARINGLESS HELICOPTER ROTOR SYSTEM

Buford J. Schramm, 1330 E. Fremont Dr., Tempe, Ariz. 85281

Continuation-in-part of Ser. No. 340,774, Jan. 19, 1982, Pat. No. 4,403,918, which is a continuation-in-part of Ser. No. 26,653, Apr. 23, 1979, Pat. No. 4,316,700. This application Sep. 7, 1983, Ser. No. 529,942

Int. Cl.[4] B64C *27/38*

U.S. Cl. 416—138 **19 Claims**



1. A helicopter rotor system comprising:

a rotary mast having an upright axis;

three or more rotor blades mounted to said rotary mast to be turned by said mast, each said blade having a respective longitudinal axis directed away from said mast, all of said rotor blades being substantially identical to one another, and being angularly spaced apart around said mast, each said blade comprising a skin forming an airfoil and an internal region, a counterweight rod and a spar extending longitudinally inside said region, said spar comprising a bundle of aligned fibers which, inside said region are bonded to each other, to said skin, and to said counterweight rod, said bundle being doubled and divided so as to form inboard of said skin a pair of U-shaped bight portions, each with a bend and a pair of arms, said arms being stiffly flexible, said fibers inside said region constituting continuations of the fibers in said bight portions, said fibers in bight portions being bonded together, whereby the total cross-section area of said fibers is substantially constant from the inboard end of said arms through the major portion of the length of the spar;

attachment means attaching each of said bight portions to said mast at locations spaced apart from one another and substantially spaced from the center of said shaft, both on the same side of the center of the mast;

a longitudinally-extending torque tube rigidly attached to said counterweight rod at a first end of each said torque tube, and a first bearing member adjacent to the other end of said torque tube, said torque tube having an axis; and

a second bearing member mounted to said attachment means and to said first bearing member, whereby said torque tube is rotatable around its own axis, and can move in any angular direction away from said longitudinal axis around the center of said second bearing means, whereby to enable lead/lag, feathering and flapping movements.

4,616,978

FLUID SUPPLY SURGE CONTROL SYSTEM

Ronald R. Matheson, Utica, and Daniel E. Hucul, Bloomfield Hills, both of Mich., assignors to Auto/Con, Roseville, Mich.

Filed Feb. 11, 1985, Ser. No. 700,494

Int. Cl.[4] F04B *49/02, 49/08;* B67D *5/00*

U.S. Cl. 417—2 **38 Claims**

1. A fluid supply system for controlling the pressure of fluid delivered from a fluid reservoir, comprising:

means for pumping the fluid from the reservoir,

a manifold,

pump outlet means communicating said pumping means with said manifold,

outlet means communicating with said manifold for discharging the fluid,

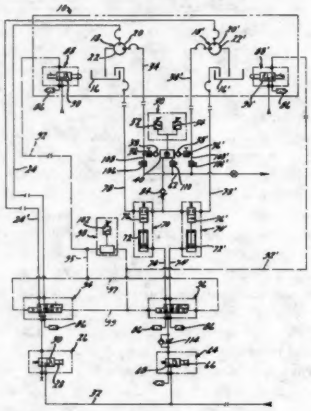
vent return means communicating said manifold with the

reservoir for returning the fluid from said manifold to the reservoir,

high pressure sensing means communicating with said manifold, said high pressure sensing means having a sensing threshold,

low pressure sensing means communicating with said manifold, said low pressure sensing means having a sensing threshold which is less than said sensing threshold of said high pressure sensing means,

control means for said pumping means for energizing said pumping means in response to said low pressure sensing means when the pressure of the fluid in said manifold falls below said low pressure sensing means threshold,



whereby the pressure of said fluid in said manifold is increased to above said low pressure sensing means threshold, and

vent control means for closing said vent return means and opening said vent return means in response to said high pressure sensing means when the pressure of the fluid in said manifold exceeds said high pressure sensing means threshold, whereby the pressure of said fluid in said manifold is decreased to below said high pressure sensing means threshold wherein when the pressure sensed in said manifold is between said high and low pressure sensing means thresholds, said pumping means is deenergized and said vent return means is closed.

4,616,979

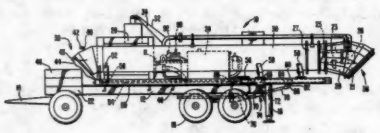
MOBILE PUMP SYSTEM

Maurice A. Hynes, Fort Lauderdale, and Roger L. Freeman, Lauderhill, both of Fla., assignors to Atlantic Hydrodynamics, Inc., Fort Lauderdale, Fla.

Filed Jun. 29, 1983, Ser. No. 509,020

Int. Cl.[4] F04B *17/06, 35/06*

U.S. Cl. 417—231 **14 Claims**



1. A mobile pump system comprising:

a self-contained power source;

hydraulic fluid supply means powered by said power source for supplying pressurized hydraulic fluid to the pump system;

a hydraulic motor;

a hydraulically-driven submersible pump driven by said hydraulic motor;

a rigid discharge tube having an intake end and a discharge end, said hydraulic pump and said hydraulic motor located within said discharge tube near the intake end of said discharge tube;

a hydraulically-actuated, linearly extensible, multi-angular extension means fixed to said discharge tube for linearly extending and retracting said discharge tube at various angles with respect to a horizontal plane;

a single pivot assembly fixed to said hydraulically-actuated linearly extensible extension means for pivoting said discharge tube and said extension means, said single pivot assembly comprising a pivot bracket fixed to said extension means, said pivot bracket having a pivot point located below the horizontal plane of said extension means;

hydraulically driven pivot actuating means fixed to said hydraulically-actuated, linearly extensible, multi-angular extension means for pivoting said discharge tube and said extension means about said pivot point, said pivot actuating means comprising a hydraulically extensible pivot arm, flexibly coupled to said extension means so that as said pivot arm is actuated said extension means and said rigid discharge tube are pivoted about said pivot point;

control means for independently controlling and maintaining the supply of hydraulic fluid in the pump system; and

transport means for transporting the pump system from one position to another position.

4,616,980

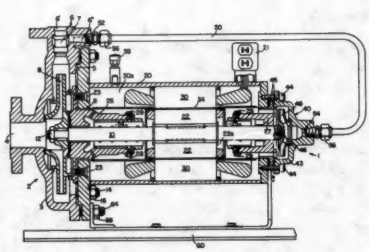
CANNED MOTOR PUMPS PRESSURIZED RECIRCULATION SYSTEM

Richard G. Carpenter, Doylestown, Pa., assignor to Crane Co., New York, N.Y.

Continuation of Ser. No. 558,602, Dec. 6, 1983, abandoned. This application Jun. 10, 1985, Ser. No. 745,811

Int. Cl.[4] F04B *17/00*

U.S. Cl. 417—357 **5 Claims**



1. A canned motor pump pressurized recirculation system which uses an enclosed motor pump, comprising:

A. a main unit, including:

a main pump;

an auxiliary pump comprising a casing and an impeller disposed therein;

motor means positioned between said main pump and said auxiliary pump for driving and for fluidly connecting said main pump and said auxiliary pump, said motor means including a rotor, a shaft associated with said rotor, a stator which surrounds said rotor, a sleeve positioned between said rotor and said stator, and means providing a flow passage from said auxiliary pump to a high pressure portion of said main pump through said sleeve; and

B. A recirculation line positioned externally of said main unit and being connected between said main pump and said auxiliary pump, said recirculation line being adapted to pass fluid from said main pump unobstructedly to said

auxiliary pump from which the fluid will be passed through said motor means to the high pressure portion of said main pump;

said auxiliary pump casing and impeller being removably secured to one end of said motor means with said impeller disposed externally of said sleeve.

4,616,981

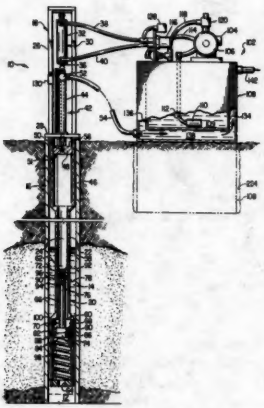
PUMPING APPARATUS WITH A DOWN-HALE SPRING LOADED PISTON ACTUATED BY FLUID PRESSURE

Eugene D. Simmons, 1108 N. Pennsylvania; Graham C. Thomson, III, 1502 N. Ohio, and Richard J. Reynaud, 1502 N. Ohio, all of Roswell, N. Mex. 88201

Filed Oct. 19, 1984, Ser. No. 662,963

Int. Cl.[4] F04B *47/08*

U.S. Cl. 417—378 **11 Claims**



1. A pumping apparatus for pumping a fluid from a reservoir to a collection location, tubing interconnecting the reservoir and collection location, comprising:

a reservoir unit including:

(a) a housing secured to said tubing, the interior of the housing being a fluid communication with the passage in the tubing, the interior of the housing defining a top cylinder and a bottom cylinder, the cross section of the bottom cylinder being larger than the cross section of the top cylinder;

(b) a piston assembly including a top piston having an outer face and an inner face for sliding sealed motion along the top cylinder of the housing, a bottom piston having an outer face and an inner face for sliding sealed motion along the bottom cylinder of the housing and a member interconnecting the top and bottom pistons so that the top and bottom pistons move jointly, the inner face of the top and bottom pistons and housing defining a storage chamber therebetween, the outer face of the top piston being exposed to fluid in the passage of the tubing, the outer face of the bottom piston being exposed to fluid in the reservoir through an opening formed in the housing permitting fluid from the reservoir to enter the interior of the housing, the piston assembly being movable relative the housing from a rest position to increase the volume of the storage chamber;

(c) spring means acting between the housing and piston assembly for urging the piston assembly to the rest position, movement of the piston assembly from the rest position causing potential energy to be stored within said spring means to increase the force exerted by said spring means on the piston assembly to move the piston assembly to the rest position;

(d) first check valve means for permitting flow of fluid from the reservoir to the storage chamber when the storage chamber fluid pressure is less than the reservoir fluid pressure and preventing reverse flow;

(e) second check valve means for permitting flow of fluid from the storage chamber to the passage in the tubing when the storage chamber of fluid pressure exceeds the fluid pressure in the passage in the tubing and preventing reverse flow; and

a pumping unit positioned along the tubing remote from the reservoir unit comprising:

(a) a pulser piston having a first face;

(b) structure defining a pulser piston cylinder, the pulser piston for sliding sealed motion along the pulser piston cylinder, the structure being secured to the tubing so that the first face of the pulser piston is in fluid communication with the fluid in the passage in the tubing;

(c) a valve positioned in the tubing operable between closed and open positions, the valve in the closed position stopping flow through the passage in the tubing and in the open position allowing flow through the passage in the tubing;

(d) pumping means for moving the pulser piston in a first direction relative to the pulser piston cylinder with the valve closed to pressurize the fluid in the passage in the tubing between the valve and reservoir unit to a predetermined pressure, the predetermined pressure acting against the outer face of the top piston to move the piston assembly away from the rest position, the volume of the storage chamber increasing with fluid from the reservoir passing through the first check valve means to the storage chamber, the movement of the piston assembly from the rest position storing potential energy in the spring means, said pumping means further for permitting the pulser piston to move in the opposite direction relative the pulser piston cylinder with the valve opened, the spring means urging the piston assembly to the rest position, causing the storage chamber to reduce in volume and pump fluid from the storage chamber through the second check valve means and valve to the collection location.

4,616,982

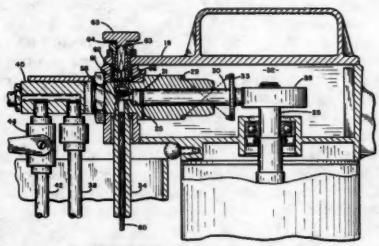
SUBMERSIBLE HIGH PRESSURE PUMP

Vernon K. Quarve, Minneapolis, Minn., assignor to Graco Inc., Minneapolis, Minn.

Filed Oct. 17, 1984, Ser. No. 661,944

Int. Cl.[4] F04B *43/06*

U.S. Cl. 417—383 **13 Claims**



1. A submersible high pressure pump and hydraulic pump driving system, comprising:

(a) a submersible pump head including an interior volume separated into two chambers by a diaphragm membrane, one of said chambers being a liquid pumping chamber and the other chamber being an oil chamber, and including inlet and outlet check valves in said liquid pumping chamber;

(b) a reciprocable piston and cylinder assembly, including an

oil pumping chamber, said cylinder opening into said oil pumping chamber; said reciprocable piston and cylinder assembly being elevated above and spaced apart from said submersible pump head;

(c) an elongated tube connected between said oil pumping chamber and said oil chamber; whereby said pump head may be immersed in liquid and said piston and cylinder assembly may be spaced away from immersion in liquid; and

(d) an incompressible solid in said tube, said solid sized to occupy substantially the entire volume of a predetermined length of said tube, said length being determined by subtracting from the total length of said tube the length of a volume of oil in said tube corresponding to the volumetric displacement of said reciprocable piston, while permitting free reciprocating motion of said solid in said tube; said oil pumping chamber, said elongated tube and said oil chamber being filled with oil.

4,616,983

PISTON OR PLUNGER PUMP

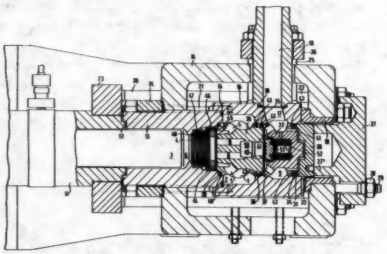
Nabil Hanafi, Bad Urach, Fed. Rep. of Germany, assignor to Uraca Pumpenfabrik GmbH & Co. KG, Bad Urach, Fed. Rep. of Germany

Filed Feb. 1, 1985, Ser. No. 697,348

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1984, 3404520

Int. Cl.[4] F04B *21/02*; F16J *10/02*

U.S. Cl. 417—571 **13 Claims**



1. A plunger pump, comprising at least one plunger; a cylinder part coaxial thereto and accommodating a working chamber for the plunger; a cylinder head which has a cylindrical pressure chamber filled with a pump medium and which is coaxially disposed relative to the plunger and is connected to a pressure line; a central valve housing which has end faces and is axially positioned between the working chamber of the plunger and the pressure chamber, said valve housing being sealed relative to the cylinder part and also the cylinder head by means of seals and having seats; a suction valve and a discharge valve arranged at said end faces on said seats, said valve housing having at least one axial passage controlled by the discharge valve and a suction passage extending from a peripheral surface of the valve housing to a suction valve side end surface thereof and controlled by the suction valve, the central valve housing being inserted through an end face opening formed in an end face of the cylinder head remote from the plunger into the cylinder head; a base part which closes said opening and secures said valve housing, said valve housing being sealed relative to the cylinder part and the cylinder head by the base part which axially clamps the central valve housing against the cylinder part; a piston-like part which has two end faces and is inserted into the pressure chamber and which is acted on at its two end faces by the pressure of the pump medium in the pressure chamber; said end faces having similar cross-section whereby fluid forces acting on said end faces cancel each other to a large degree; and base part pressing ring seals, which are arranged between the piston-like part and the base part and also the central valve housing in peripheral grooves formed between the respective parts to transmit axial clamping forces radially outwardly against a wall of the pressure chamber while deforming said seals.

4,616,984

SLIDING-VANE ROTARY COMPRESSOR WITH SPECIFIC CYLINDER BORE PROFILE

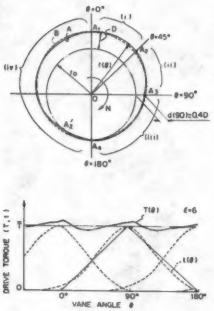
Mitsuo Inagaki, Okazaki; Kenji Takeda, Nukata; Shigeki Iwanami; Hideaki Sasaya, both of Okazaki, and Eiichi Nagasaku, Chiryu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Nippon Soken, Inc., Nishio, both of, Japan

Filed Mar. 14, 1985, Ser. No. 711,839

Claims priority, application Japan, Mar. 14, 1984, 59-47178

Int. Cl.[4] F04C *18/00*

U.S. Cl. 418—150 **5 Claims**



1. In a sliding-vane rotary compressor including a vaned rotor and a pump cylinder having a cylinder bore, said compressor comprising four slidable vanes spaced apart from each other at an equal angular distance, said compressor having a single pumping chamber defined by said rotor and said pump cylinder, said vanes engaging the wall of said cylinder bore during rotation of said rotor to form cycles of intake, compression and delivery strokes for said vanes, the improvements wherein said cylinder bore has such a profile that the individual torque applied to an individual vane during each cycle of compression and delivery strokes of said vane varies along a torque curve which approximates an isosceles triangle, the lower side of which corresponds to a range of rotational angle of approximately 180°.

4,616,985

VANE TYPE COMPRESSOR HAVING AN IMPROVED ROTATABLE SLEEVE

Toshihiko Hattori; Yuji Akagi, and Hideo Kohara, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 30, 1984, Ser. No. 595,493

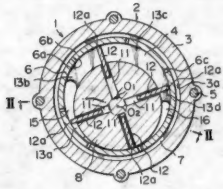
Claims priority, application Japan, Mar. 31, 1983, 58-57619

Int. Cl.[4] F04C *29/00*

U.S. Cl. 418—173 **7 Claims**

1. A vane type rotary compressor comprising a housing having ᴘ cylindrical inner wall surface, a rotatable sleeve having outer and inner surfaces and disposed in the housing for rotation about a first longitudinal axis, a rotor disposed in the sleeve for rotation about a second longitudinal axis which is offset from the first longitudinal axis, a plurality of vanes carried by the rotor to extend in radial directions and maintained in contact with the inner surface of the sleeve to divide the interior of the sleeve into a plurality of working chambers, the rotatable sleeve being made of an Si-Al type alloy containing 12 to 25% by weight of Si, said sleeve being age hardened so that Si particles are distributed substantially uniformly therein,

said sleeve having an anodic oxidation coating of 100 to 300 microns thickness on at least the outer surface thereof and a



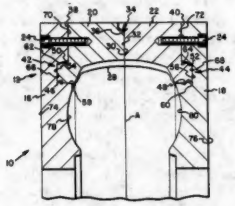
coating of wear resistant resin overlying the anodic oxidation coating formed on the outer surface thereof.

4,616,986

LIGHT WEIGHT TIRE MOLD FOR TWO PIECE TREAD RING

Howard L. Hill, Keyser, W. Va., and Gary L. Gillum, Cumberland, Md., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 19, 1984, Ser. No. 662,654
Int. Cl.[4] B29C *33/00*
U.S. Cl. 425—32 **9 Claims**



1. A two piece tire vulcanizing press mold for use in a tire press, said mold having sidewall rings each having means for molding a tire sidewall and having a thickness to withstand the press pressure and a split tread ring with a tread pattern inside thereof, at least one part of said tread ring being a single piece and extending from an outside diameter of the mold to the innermost inside diameter of the mold tread pattern, at least one sidewall ring engageably mating with, and extending along an outer face of said at least one half tread ring which alone forms the parting line for the mold.

4,616,987

INTERNAL BORE IMPRESSION TOOL

Charles L. Boyers, Carmel, and John W. Finlayson, Ventura, both of Calif., assignors to Vetco Offshore Industries, Inc., Ventura, Calif.

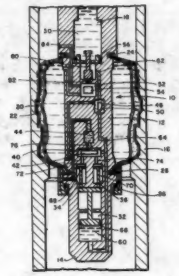
Filed Jun. 17, 1985, Ser. No. 745,053
Int. Cl.[4] B29C *3/00*; B30B *5/02*
U.S. Cl. 425—89 **14 Claims**

1. A tool for taking the impression of an area of the internal bore of a tubular member or of a joint between tubular members joined together comprising,

a body member of a diameter to enter the bore,

a pair of resilient membranes each surrounding the outer periphery of said body member,

means in said body member for directing a casting compound between said membranes and for inflating and expanding said membranes into engagement with said bore, and



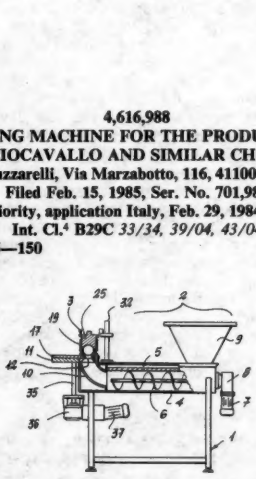
means for deflating said expanded membranes to allow said tool to be withdrawn from said bore.

4,616,988

MOULDING MACHINE FOR THE PRODUCTION OF CACIOCAVALLO AND SIMILAR CHEESES

Gabriele Muzzarelli, Via Marzabotto, 116, 41100 Modena, Italy

Filed Feb. 15, 1985, Ser. No. 701,984
Claims priority, application Italy, Feb. 29, 1984, 21050/84[U]
Int. Cl.[4] B29C *33/34, 39/04, 43/04*
U.S. Cl. 425—150 **17 Claims**



1. A moulding machine for the production of caciocavallo, provola, scamorza and similar plastic curd cheeses, comprising a thrust section for the plastic curd, and an actual moulding section fed by the thrust section and comprising:

(a) a fixed plate provided with apertures for receiving the plastic curd supplied by the thrust section; and

(b) a stepwise-rotating plate provided with a series of moulds which have an inlet alignable with said aperture and are removably connected to the rotating plate in order to allow extraction of the moulded whole cheese,

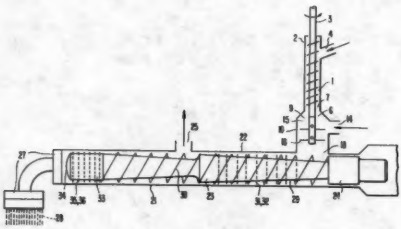
each said mould having an internal cavity of cross-sectional area in a plane transverse to the direction of plastic curd flow at all times greater than cross-sectional area of said aperture.

4,616,989

APPARATUS FOR THE INCORPORATION OF GLASS FIBERS INTO THERMOPLASTIC SYNTHETIC RESINS

Heinz Mewes, Troisdorf-Spich; Wilhelm Nachtigall, Troisdorf-Eschmar; Michael Wienand, deceased, late of Siegburg; by Anneliese Wienand, legal representative; by Hans-Jürg W. Wienand, heir, both of Siegburg; by Michael Wienand, heir, Krefeld; by Rudolf J. Wienand, heir; by Karl F. Wienand, heir, both of Siegburg, and by Elisabeth H. M. Wienand, heir, Krefeld, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 877,805, Feb. 15, 1978, abandoned.
This application Aug. 27, 1982, Ser. No. 411,998
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1977, 2706755
Int. Cl.[4] B29B 7/14, 7/18
U.S. Cl. 425—203 19 Claims



1. An apparatus for incorporating glass fibers into a molten thermoplastic synthetic resin which comprises a two-stage degasifying screw-type extruder having an inlet for entry of a premix of preheated glass fiber and molten thermoplastic synthetic resin and an extrusion die at an outlet end thereof for extruding a mixture of said glass fibers and said molten thermoplastic synthetic resin, means for preheating glass fibers to a temperature from 60° to 120° C. below the melting point of the thermoplastic synthetic resin up to the melting point of the synthetic resin, a melt extruder for extruding molten thermoplastic synthetic resin, a premixing chamber provided with one inlet port for entry of the preheated glass fibers, with another inlet port for separate entry of the molten thermoplastic synthetic resin and with an outlet port for discharging a premix of glass fibers and molten thermoplastic synthetic resin, and feeding means for introducing the preheated glass fibers in metered amounts into the inlet port of said premixing chamber; said outlet port of said premixing chamber being directly connected to said inlet of the degasifying extruder to discharge the premix of glass fibers and molten thermoplastic synthetic resin directly into said degasifying screw-type extruder.

4,616,990

VARIABLE PISTON ARRANGMENT FOR ROLL AND BREAD DIVIDING AND SHAPING MACHINE

Walter Kopp, Carteret, N.J., assignor to Adam Equipment Corp., Eatontown, N.J.

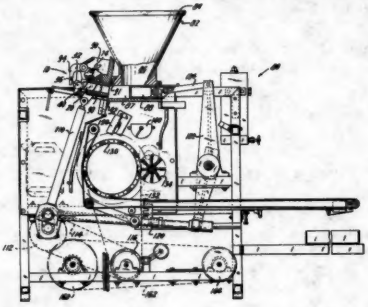
Filed Apr. 10, 1985, Ser. No. 721,874
Int. Cl.[4] A21C 5/02
U.S. Cl. 425—239 16 Claims

1. A variable housing-piston arrangement especially adapted for use in conjunction with a roll and bread dividing and shaping machine comprising, in combination,

a piston-housing including an open internal area adapted to receive baking dough, said piston-housing itself being adapted to function as a piston within a separate open internal area of a separate housing adapted to receive dough, and said piston-housing being adapted to receive at least one separate and independently operable piston within said open internal area of said piston-housing;

at least one separate piston disposed in said open internal area of said piston-housing, said separate piston being adapted to be fixed in position within said piston-housing or be made to move, independently of said piston-housing, within said internal area of said piston-housing, and

piston control means for independently controlling operation and movement of said separate piston within said internal area of said piston-housing, and controlling movement of said piston-housing itself, whereby fixing the position of said piston-housing and withdrawal of a portion of said separate pistons, by means of said piston control means and dough entering said internal area of said piston-housing, a predetermined distance out from said



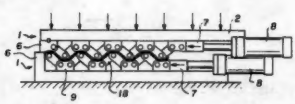
internal area of said piston-housing leaves a predetermined vacated area in said piston-housing for received baking dough, which area conforms in size and shape to the desired size and shape of the roll or bread to be baked, and withdrawal of said piston-housing and said separate piston as a single unit from said separate open internal area of said separate housing, by means of said piston control means, leaves a predetermined vacated area in said separate housing for receiving baking dough which area conforms in size and shape to the desired size and shape of the roll or bread to be baked.

4,616,991

APPARATUS FOR THE MANUFACTURE OF A CORRUGATED WAFER BOARD PANEL

Lars Bach, and Eduard Stark, both of Edmonton, Canada, assignors to Her Majesty the Queen in right of the Province of Alberta as represented by the Minister of Energy and Natural Resources, Edmonton, Canada

Filed Aug. 15, 1985, Ser. No. 765,840
Int. Cl.[4] B29C 53/24
U.S. Cl. 425—396 4 Claims



1. A platen assembly, for use in forming corrugated wafer board panels, comprising:

support means forming a planar support surface;

parallel, spaced apart, elongate end members forming inner working faces that are generally perpendicular to the support surface, at least one of said end members being movable toward the other along the support surface while remaining parallel thereto;

a plurality of elongate bracing elements positioned on the support surface in spaced relationship, between the end members, said bracing elements being slidable along the surface in parallel relationship;

link means, pivotally interconnecting each pair of adjacent bracing elements, for providing in conjunction with said bracing elements a broad substantially non-porous platen surface whose configuration can be mechanically converted between a substantially planar form and a corrugated form; and

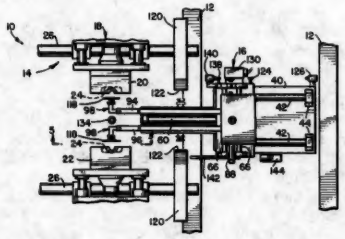
means for moving the end members together and apart to convert the link means between the corrugated and planar forms.

4,616,992

SHUTTLE-TYPE BLOW MOLDING MACHINE WITH IN-MOLD LABELING

Paul M. Oles, York, Pa., assignor to Y Technipak Corp., York, Pa.

Filed Jun. 12, 1985, Ser. No. 743,948
Int. Cl.[4] B29C *59/02*
U.S. Cl. 425—503 11 Claims



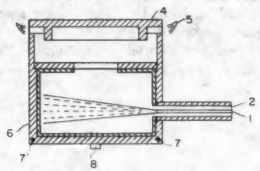
1. A label transfer assembly adapted to place labels in label discharge locations at the bottoms of recesses in open mold halves of a blow molding machine, the assembly including a label transfer carriage, first guide means supporting the label transfer carriage for forward and back movement along a first path toward and away from the label discharge locations, first drive means for moving the label transfer carriage forward and back along the first path, a pair of slide bodies, second guide means supporting the slide bodies on the label transfer carriage for movement back and forth along a second path extending transverse to said first path, a mechanical drive connection directly joining the slide bodies comprising a shaft rotatably mounted on the label transfer carriage between the slide bodies, a double ended pivot arm centrally mounted on the shaft with the ends of the arm extending towards the slide bodies, and a pair of follower and groove connections each joining one end of the pivot arm to one of the slide bodies so that the arm directly joins the slide bodies to form a direct drive between the slide bodies, said connections being located at laterally offset locations with respect to said second path such that movement of one slide body in either direction along said second path is transmitted through the connections and arm to the other slide body reversed in direction to move the other slide body along the second path in an opposite direction, second drive means for simultaneously moving said slide bodies along said second path in opposite directions between closed and opened positions, label transfer heads mounted on the slide bodies and a pair of label magazines on the assembly, the magazines including means for supplying labels at opposed spaced label pickup locations whereby the first drive means moves the label transfer carriage back and forth between locations where the label transfer heads are adjacent the pickup locations and the label discharge locations and the second drive means moves the slide bodies between closed and open positions and the label pickup heads are moved from retracted positions to positions adjacent the label pickup and label discharge locations, dependent upon the position of the label transfer carriage.

4,616,993

LIQUID FUEL COMBUSTION APPARATUS

Tadashi Hikino, Ikoma, and Kunihiro Turuda, Kashihara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jul. 3, 1984, Ser. No. 627,726
Claims priority, application Japan, Jul. 7, 1983, 58-123828; Jul. 7, 1983, 58-123829; Jul. 26, 1983, 58-136992
Int. Cl.[4] F23N *1/00;* F23D *11/44*
U.S. Cl. 431—41 18 Claims



1. A liquid fuel combustion apparatus, comprising:

a circular vaporizer which includes a burner head, for burning a mixed gas of fuel and air, disposed on a circular metal vessel, said circular metal vessel having an interior defined by at least an inner wall;

an electric sheath heater embedded in said circular metal vessel, for supplying heat to said circular metal vessel in addition to heat feedback by thermal conduction from said burner head to maintain said circular metal vessel at a temperature for boiling a liquid fuel film;

a thermometer attached to said circular metal vessel;

an air inlet and a liquid fuel inlet being in fluid communication with said interior of said circular metal vessel; and

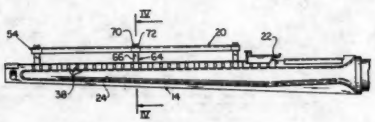
means for reducing accumulation of tar which results from boiling a liquid fuel film in said circular metal vessel, said means being a film coated on at least part of said inner wall, said film consisting essentially of 15.0 to 50.0 wt.% high-thermal conductive and high-emissive material, 0.1 to 15.0 wt.% catalyst for decomposing organic materials and 40.0 to 80.0 wt.% binder.

4,616,994

GAS BURNER WITH MEANS FOR REDUCING NO_x EMISSIONS

Ronald S. Tomlinson, Antioch Township, Davidson County, Tenn., assignor to Heil-Quaker Corporation, Benton Harbor, Mich.

Filed Oct. 5, 1984, Ser. No. 658,204
Int. Cl.[4] F23D *14/12*
U.S. Cl. 431—347 17 Claims



1. In a gas burner having a plurality of serially arranged burner ports for producing a gas flame which extends along at least a portion of the length of the burner, said flame having an inner, high temperature region and an outer region of lower temperature, means for reducing NO_x emissions during operation of said burner comprising:

a metal insert extending along and proximate to at least a portion of said serially arranged burner ports, said insert disposed within said lower temperature region of said gas flame directly adjacent said higher temperature region of said flame; and

support means extending from said insert into at least one of

said burner ports, said support means being slightly smaller in cross section than said burner port so as to be movably retained within said burner port to permit slight longitudinal movement of said insert in response to thermal expansion and contraction of said insert relative to said burner as an incident of operation of said burner.

4,616,995

TUNNEL DRYER FOR BRICKS AND LIKE OBJECTS

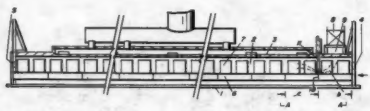
Hans Lingl, Jr., Neu-Ulm, Fed. Rep. of Germany, assignor to Lingl Corporation, Paris, Tenn.

Filed Jun. 28, 1985, Ser. No. 749,755

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1984, 3425523

Int. Cl.⁴ F27D *3/00*; F27B *9/26, 7/00*

U.S. Cl. 432—9 **10 Claims**



9. A method for drying unfired objects in a dryer of the type having a tunnel defining a drying spaced in which the unfired objects are to be located and through which heated gases flow, said method comprising the steps of:

providing a continuous flow of heated gases in said drying space;

positioning a vertically adjustable partition downwardly within said tunnel at an intermediate portion of said gas flow to force the gases downwardly and under said vertically adjustable partition; and

exhausting said continuous flow of heated gases from said drying space.

4,616,996

NON-OXIDIZING ATMOSPHERE FIRING FURNACE FOR CERAMIC ARTICLES

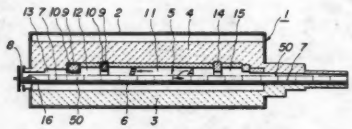
Takehiro Kajihara, Komaki, and Mitsugu Suzuki, Yokkaichi, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Aug. 19, 1985, Ser. No. 766,719

Claims priority, application Japan, Aug. 31, 1984, 59-133255[U]

Int. Cl.⁴ F27B *5/04, 7/00, 5/16*; F27D *23/00*

U.S. Cl. 432—148 **18 Claims**



1. A non-oxidizing atmosphere firing furnace for firing ceramic articles, comprising a furnace chamber filled with a non-oxidizing gas, a conveyor mechanism provided on a floor portion of the furnace chamber, said conveyor mechanism moving the ceramic articles opposite to a direction in which the non-oxidizing gas flows through the furnace chamber; and at least one partition wall having at least its surface composed of molybdenum, said partition wall being provided on a ceiling portion of the furnace chamber to define a low temperature zone on the inlet side for the ceramic articles and a high temperature zone.

4,616,997

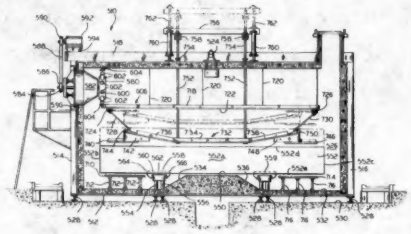
INGOT PUSHER FURNACE

Robert H. Ross, Meadville, Pa., assignor to Seco/Warwick Corporation, Meadville, Pa.

Continuation-in-part of Ser. No. 770,438, Aug. 29, 1985, Pat. No. 4,585,412, which is a continuation-in-part of Ser. No. 585,324, Mar. 1, 1984, Pat. No. 4,540,363. This application Jan. 23, 1986, Ser. No. 821,826

Int. Cl.⁴ F27B *9/00*; F27D *7/04*

U.S. Cl. 432—148 **9 Claims**



1. An ingot pusher furnace for heating an ingot comprising:

an enclosure having a base, a plurality of vertical side walls connected to said base and a top wall;

means for heating said enclosure by heating a gaseous medium therein;

means for moving said gaseous medium within said enclosure;

a fixed baffle assembly suspended from said top wall, said baffle assembly including a horizontal top baffle plate and a bottom baffle sheet disposed below said top plate, said bottom baffle sheet including a center portion and a pair of first and second upwardly sloping end portions connected to said center portion, said center portion being positioned substantially parallel to an upper surface of a center portion of the ingot;

a first deflection baffle being rotatably supported at its one end by a pipe to said baffle assembly adjacent the first sloping end portion;

a second deflection baffle being rotatably supported at its one end by a pipe to said baffle assembly adjacent the second sloping end portion;

linkage means connected to the other ends of said first and said deflection baffles for moving said first and second deflection baffles between a horizontal position parallel to the upper surface of the ingot and an acute angle position relative to the horizontal position; and

whereby when the gaseous medium is forced between the upper surface of the ingot and the deflection baffles its velocity is increased

from the ends of the ingot to the center of the ingot so as to provide uniform heat transfer throughout the ingot.

4,616,998

FACE BOW AND METHOD OF USE IN ORTHODONTIC PROCEDURES

Brian W. Wong, 215 Red Rock Way #J106, San Francisco, Calif. 94131

Filed Sep. 12, 1984, Ser. No. 650,283

Int. Cl.⁴ A61C *19/04*

U.S. Cl. 433—73 **10 Claims**

1. A method for accurately obtaining gnathological relationship data from a patient, the steps comprising:

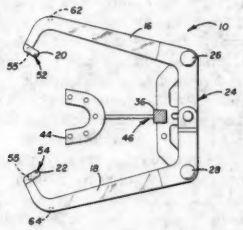
forming a radiolucent face bow having lateral arm pieces formed from radioluscent material selected for permitting anatomical features of the patient to be clearly viewed in a cephalometric head film;

positioning a radiopaque marker on said radioluscent face

bow in a position to enable accurate detection of said marker in a cephalometric head film;

mounting said radioluscent face bow upon the patient's head in a predetermined position relative to selected external anatomical features of the patient;

obtaining one or more dentition impressions of the patient by means of the radioluscent face bow; and



producing a cephalometric head film of the patient with the radioluscent face bow in place on the patient in order to enable accurate correlation between anatomical features of the patient and said radiopaque marker on said radioluscent face bow.

4,616,999

BONDING DENTAL PIN

Bernard Weissman, New York, N.Y., assignor to IPCO Corporation, White Plains, N.Y.

Filed Jun. 7, 1985, Ser. No. 742,429

Int. Cl.[4] A61C *5/04*

U.S. Cl. 433—225 **23 Claims**

1. A bonding dental pin for aiding in retention of a thin layer of bonding material onto a tooth structure, comprising:

an elongated body member;

a lower body portion of said body member including anchoring means for securing said lower body portion into the tooth structure;

said body member including a neck portion for embedding in the bonding material;

a radially projecting stop flange interposed between said lower body portion and said neck portion for limiting insertion depth of said body portion into the tooth structure;

a radially projecting head portion flange disposed at an upper end of said neck portion and longitudinally spaced from said stop flange for embedding in the bonding material;

retention means for securing an upper body portion of said body member within the bonding material; and

said retention means including providing said head portion flange with an inwardly directed concave lower surface and said stop flange with an inwardly directed concave upper surface, said concave lower and upper surfaces confronting each other to define a pocket therebetween for receiving the bonding material therein.

4,617,000

MOORING BUOY WITH INDIVIDUALLY FLOATABLE MAIN BODY AND TURNTABLE

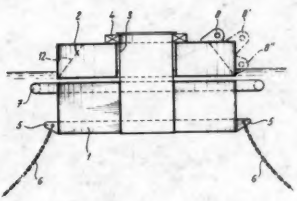
Michel Girardot, and Leendert Poldervaart, both of La Turbie, France, assignors to Single Buoy Moorings, Inc., Marly, Switzerland

Continuation of Ser. No. 534,199, Sep. 21, 1983, abandoned. This application Jun. 13, 1985, Ser. No. 744,882

Claims priority, application Netherlands, Jun. 21, 1983, 8302203

Int. Cl.[4] B63B *22/02*

U.S. Cl. 441—3 **5 Claims**



1. A buoy exhibiting increased stability and simplified serviceability and comprising a main body having sufficient buoyancy to float individually and provided with means for the attachment of anchoring chains, a central sleeve extending upwardly from said main body, and a turntable having sufficient buoyancy to float individually from said main body and rotatably supported on said central sleeve by means of a single axial radial bearing positioned between the turntable and the central sleeve, wherein said bearing is located only at the upper end of said sleeve and above the water level with an inner ring of said bearing being secured to the central sleeve and an outer ring of said bearing being secured to said turntable.

4,617,001

ELEMENTS OF A CONSTRUCTION OR ASSEMBLY SET, AND ACCESSORIES

Eric W. Parein, Faiderstraat 79, Elsene, Belgium (B-1050)

PCT No. PCT/BE82/00012, § 371 Date Jan. 12, 1983, § 102(e) Date Jan. 12, 1983, PCT Pub. No. WO82/04196, PCT Pub. Date Dec. 9, 1982

PCT Filed May 27, 1982, Ser. No. 459,572

Claims priority, application Belgium, Jun. 2, 1981, BE 204.966; Sep. 30, 1981, BE 206.117

Int. Cl.[4] A63H *33/08*

U.S. Cl. 446—102 **25 Claims**

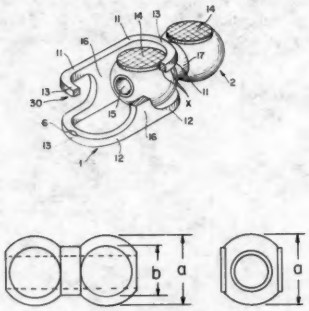
1. A detachable link type of device which comprises:

a first link having opposite end portions connected by a first intermediate portion and a second link having opposite end portions connected by a second intermediate portion,

one end portion of the first link having a spherical surface portion and the first intermediate portion being in the form of a cylinder joined to said one end portion to define a cylindrical, annular surface immediately adjacent said one end portion;

one end portion of said second link being adapted to receive and capture said one end portion of the first link in snap-fit relation, said one end portion of the second link including a pair of generally U-shaped and parallel arms extending from said second intermediate portion and which are spaced apart a distance less than the diameter of said spherical surface portion to define a slot therebetween, each of said arms including a bight, said slot being of a width substantially equal to the diameter of said cylinder and said arms being resiliently deformable to spread apart

and pass said spherical surface portion therebetween and then snap back toward said cylinder to capture said spherical surface portion of the first link, said slot extending from said intermediate portion on one side of said second link to the intermediate portion on the other side of said second link and being of substantially uniform width, the ends of said slot at said intermediate portion being arcuate



to define first seat portions for line contact with said part-spherical portion, the inner sides of the bights of said arms defining second seat portions for line contact with said part-spherical portion and said first and second seat portions being located with respect to each other so as to capture and hold said part-spherical portion while said cylindrical portion is disposed within said slot.

4,617,002

WIRELESS CONTROLLABLE CAR WITH A WINCH MECHANISM

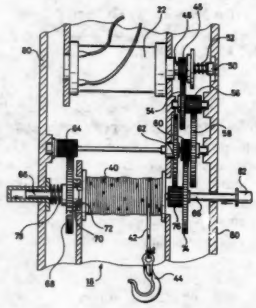
Zenichi Ishimoto, and Tadashi Konno, both of Tokyo, Japan, assignors to Nikko Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 657,874, Oct. 4, 1984, abandoned. This application Nov. 22, 1985, Ser. No. 800,375

Claims priority, application Japan, Apr. 13, 1984, 59-53454[U]

Int. Cl.[4] A63H *17/14, 30/04*

U.S. Cl. 446—427 **1 Claim**



1. A wireless-controllable toy car with a winch mechanism, comprising driving wheels and a winch mechanism, an electric motor for driving and controlling the wheels, another electric motor for operating the winch mechanism, a single two-position changeover switch for switching a power circuit for the electric motors thereby selectively to actuate one or the other of the electric motors, the electric motor for controlling the operation of the winch mechanism having an output shaft, reduction gearing connecting said output shaft to a winch drum of said winch mechanism, idling means between said output shaft and said reduction gearing for preventing overload of the winch mechanism electric motor upon stopping of the winch drum at the end of a winding cycle of the winch mechanism, said idling means comprising a gear idly mounted on said output shaft between two fixed rings, and resilient means acting against one of said fixed rings and pressing said gear against the other of said fixed rings, the reduction gearing including a winch drum shaft on which said winch drum is supported, a reduction gear fixedly secured to said winch drum shaft, said drum having a face adjacent said reduction gear, meshing elements on said reduction gear and said face that engage with each other in the direction of rotation of the winch drum to drive the winch drum in rotation, the winch drum shaft being mounted for slidable movement axially within the winch drum, and means for sliding the shaft axially to disengage said meshing elements from each other thereby to disengage the reduction gear from the winch drum to permit free withdrawal of a filament wound on the winch drum, and means resiliently urging the winch drum shaft in a direction to engage said meshing elements.

4,617,003

ADJUSTABLE FRICTION CLUTCH ASSEMBLY

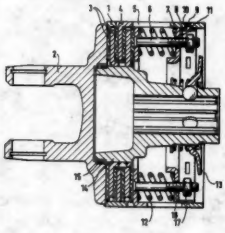
Helmut Bober, Neunkirchen; Theo Buthe, Lohmar; Karl Coenen, Hennef; Norbert Fartmann, Siegburg; Klaus Herbertz, Lohmar; Heinz Koch, Hennef; Horst Kretschmer, Colonge; Clemens Nienhaus, Lohmar; Peter Schardt, Neunkirchen; Jürgen Schibrowski, Lohmar, and Willi Schmandt, Siegburg, all of Fed. Rep. of Germany, assignors to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed May 20, 1985, Ser. No. 735,838

Claims priority, application Fed. Rep. of Germany, May 18, 1984, 3418558

Int. Cl.[4] F16D *7/02*

U.S. Cl. 464—48 **3 Claims**



1. An adjustable friction clutch assembly, especially suitable for use in drive lines for connecting an agricultural implement with a power takeoff shaft of a tractor, comprising:

a clutch hub consisting of a first clutch part;

a dish-shaped clutch housing consisting of a second clutch part;

a pressure plate;

a friction assembly for placing said first and second clutch parts in torque transmitting engagement, said friction assembly comprising intermediate plates arranged between said clutch parts for being alternately nonrotatingly connected to one of said clutch parts and annular friction linings provided between said intermediate plates;

axially acting pressure springs having one end acting on said friction assembly and an opposite end held in said pressure plate;

a supporting ring operating to support said pressure plate against said clutch housing;

radially outwardly extending cams provided on said supporting ring axially offset from the center thereof; and

two rows of apertures provided on a cylindrical face of said clutch housing within which said outwardly extending cams engage, said two rows of apertures being axially offset and offset relative to the angle of rotation and corresponding to said cams of said supporting ring;

said axially offset cams being selectively engageable with said axially offset apertures to enable adjustment of the spring force of said clutch assembly.

4,617,004

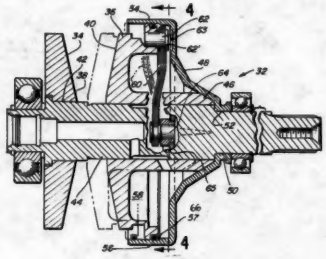
PULLEY STRAP DRIVE

Philip J. Mott, Des Plaines, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Sep. 13, 1984, Ser. No. 650,022

Int. Cl.[4] F16H *55/56*

U.S. Cl. 474—8 **5 Claims**



1. A pulley especially adapted for use in a variable pulley transmission and comprising first and second generally conical flanges mounted on a rotatable shaft and defining a generally V-shaped space therebetween, said first flange being directly and drivingly connected to said shaft for rotation therewith, said second flange being journalled for axial reciprocation on said shaft and free of direct driving connection therewith, said second flange being axially movable along said shaft relative to said first flange, a drive member concentric with and directly drivingly connected to said shaft, and a flexible strap connected to said drive member and said second flange and positioned to pivot about axes generally parallel to the axis of said shaft, said strap drivingly connecting said drive member and said second flange while permitting the axial movement of said second flange relative to said first flange, said strap lying in a generally radial plane so as to flex upon axial movement of said second flange.

4,617,005

SPEED CHANGE PULLEY WITH DIAPHRAGM SPRING AND OIL SPRING

Michel Jaccod, Champigny-sur-Marne, and Jacques T. de Briel, Levallois Perret, both of France, assignors to Valeo, Paris, France

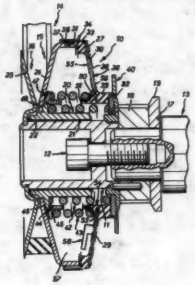
Filed Apr. 3, 1985, Ser. No. 719,488

Claims priority, application France, Apr. 6, 1984, 8405518

Int. Cl.[4] F16H *11/06*

U.S. Cl. 474—14 **18 Claims**

1. A speed change pulley comprising a hub, two annular pulley sides disposed around the hub and facing each other, one of said pulley sides being mounted for axial movement on said hub against the bias of axially acting resilient means including a diaphragm spring, said diaphragm spring including a peripheral portion rockably axially bearing against said one pulley side, and a central portion having a plurality of radial fingers separated by slots, said central portion rockably axially bearing against an abutment member fixed axially relative to said hub, said axially acting resilient means further comprising an additional coil spring disposed around the hub and bearing against a shoulder fixed axially relative to the movable pulley side and bearing said diaphragm spring, and a spacer of elastic



material being axially interposed between said coil spring and said diaphragm spring.

4,617,006

FRONT DERAILLEUR FOR A BICYCLE

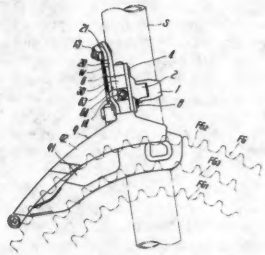
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Oct. 30, 1984, Ser. No. 666,323

Claims priority, application Japan, Nov. 4, 1983, 58-171426[U]

Int. Cl.[4] F16H *11/08, 11/00, 7/22*

U.S. Cl. 474—80 **7 Claims**



1. A front derailleur for a bicycle which is operated by a control wire to switch a driving chain from one front chain gear to another at a multistage front chain gear assembly, said front derailleur comprising:

a chain guide,

a moving means for allowing said chain guide to move axially of said multistage front chain gear assembly,

a swinging member which has first and second end portions, said first end portion comprising a support portion for supporting one of said control wire and an outer sheath for guiding said control wire, said swinging member being pivotally supported at an intermediate portion thereof located between said first and second end portions to said moving means, and .

an adjusting means disposed between said second end of said swinging member and said moving means, said adjusting means for adjusting a position of said swinging member with respect to said moving means to adjust a position of said chain guide with respect to each of said front chain gears.

4,617,007

BELT CONSTRUCTION FOR A CONTINUOUSLY VARIABLE TRANSMISSION, TRANSVERSE BELT ELEMENT THEREFOR AND METHODS OF MAKING THE SAME

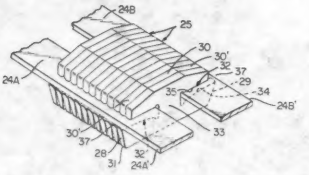
Joseph P. Miranti, Jr., Porter Township, Christian County; Larry R. Oliver, and Clyde O. Johnson, both of Springfield, all of Mo., assignors to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 501,357, Jun. 6, 1983, Pat. No. 4,533,342. This application Mar. 20, 1985, Ser. No. 713,943

The portion of the term of this patent subsequent to Aug. 6, 2002, has been disclaimed.

Int. Cl.[4] F16G *5/00, 5/12*

U.S. Cl. 474—201 **18 Claims**



1. In a belt construction for a continuously variable transmission, said belt construction comprising an endless flexible band means, and a plurality of belt elements carried by said band means in sliding relation therewith, each belt element having slot means receiving said band means therein and having opposed faces disposed in compressed relation against adjacent faces of adjacent belt elements, each belt element having opposed sides for respectively engaging pulley faces of said transmission, said slot means for each belt element defining a pair of slots respectively interrupting said opposed sides thereof and being spaced from each other by a central stem portion of said element, said pair of slots for each element receiving parts of said band means therein and respectively defining a pair of shoulders engaging said parts of said band means, each shoulder of each belt element having an arcuate transverse crown surface provided with opposed ends and an apex intermediate those opposed ends that engages its respective part of said band means, the improvement wherein said apex of each transverse crown surface of its respective belt element is offset relative to the center point thereof that is between its respective opposed ends to tend to bias its respective part of said band means toward its respective central stem rather than toward its respective side and wherein each belt element is formed substantially solely from a high performance polymeric material that has high heat resistance, high compressive modulus, high toughness and high strength.

10. In a method of making a belt construction for a continuously variable transmission, said method comprising the steps of forming an endless flexible band means, forming a plurality of belt elements, and causing said belt elements to be carried by said band means in sliding relation therewith, said step of forming said belt elements causing each belt element to have slot means receiving said band means therein, each belt element to have opposed faces disposed in compressed relation against adjacent faces of adjacent belt elements, each belt element to have opposed sides for respectively engaging pulley faces of said transmission, each belt element to have said slot means thereof defining a pair of slots respectively interrupting said opposed sides thereof and being spaced from each other by a central stem portion of said element, each belt element to have said pair of slots thereof receiving parts of said band means therein and respectively defining a pair of shoulders engaging said parts of said band means, and each belt element to have each shoulder thereof having an arcuate transverse crown surface provided with opposed end and an apex intermediate those opposed ends that engages its respective part of said band means, the improvement comprising the steps of forming said apex of each transverse crown surface of its respective belt element to be offset relative to the center point thereof that is between its respective opposed ends to tend to bias its respective part of said band means toward its respective central stem rather than toward its respective side, and forming each belt element substantially solely from a high performance polymeric material that has high heat resistance, high compressive modulus, high toughness and high strength.

4,617,008

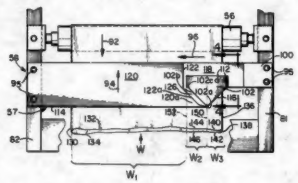
METHOD AND APPARATUS FOR FORMING HEMS IN SUPERPOSED PLIABLE PANELS

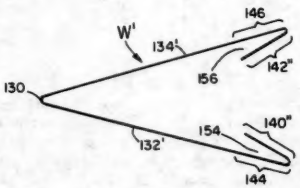
Dana M. Boyd, Rushville, and Franz Bustin, Rochester, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 20, 1984, Ser. No. 652,255

Int. Cl.[4] B31B *1/36*

U.S. Cl. 493—248 **17 Claims**





14. A method of forming a pair of inwardly turned hems in a pair of superposed continuous panels of pliable material comprising the steps of:

turning intermediate, longitudinal superposed portions of said pair of superposed panels adjoining superposed longitudinal side edge portions of the panels along one side of the panels from a first fed direction to a second taken-up direction;

turning said superposed longitudinal side edge portions of the panels from said first, fed direction to a direction transverse to said taken-up direction towards said turned intermediate portions; and

turning each of said free edge portions of each panel against the intermediate portion of the same panel to form a hem.

4,617,009

METHOD AND APPARATUS FOR CENTRIFUGAL BATCH SEPARATION OF BLOOD

L. Erik Öhlin, Stocksund; H. Peter Unger, Stockholm, and J. Eric Westberg, Lidingö, all of Sweden, assignors to Serotek-nik HG, Stocksund, Sweden

PCT No. PCT/SE83/00413, § 371 Date Jul. 26, 1984, § 102(e) Date Jul. 26, 1984, PCT Pub. No. WO84/02091, PCT Pub. Date Jun. 7, 1984

PCT Filed Nov. 28, 1983, Ser. No. 637,046

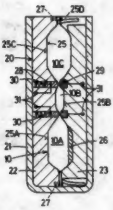
Claims priority, application Sweden, Nov. 26, 1982, 8206767

Int. Cl.[4] B04B *5/02*

U.S. Cl. 494—21 **29 Claims**

1. A method for centrifugal batch separation of blood into fractions of different densities, comprising;

(a) confining a quantity of blood in an elongated closed container having walls of flexible sheet material;
(b) placing the container with the blood therein in a rigid casing;
(c) by means of constriction means within the casing causing the container to be divided into a plurality of sections by forming a container constriction in the opposite container walls extending across the width of the container, one of said sections being an end section for receiving the fraction of the highest density and having a volume determined by the shape and dimensions of the casing; said container constriction forming a flow passage between said sections;



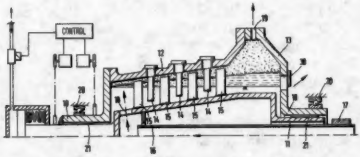
(d) placing the casing with the container in an eccentric position in a centrifuge and centrifuging it with the end of the container remote from said end section in a radially inner position and said end section in a radially outer position to cause stratification of the blood into said fractions with the interface of adjoining fractions oriented transversely of the longitudinal direction of the container; and
(e) isolating the fractions from each other within the container by pinching the container along said container constriction to close said flow passage without substantially changing the shape of the container.

4,617,010

APPARATUS FOR THE PARTIAL DEHYDRATION OF SLUDGE IN THE CENTRIFUGE FIELD OF A SOLID JACKET CENTRIFUGE

Wolfgang Epper, Bergheim, and Johannes Florenz, Monchen-Gladbach, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed May 24, 1984, Ser. No. 614,106
Claims priority, application Fed. Rep. of Germany, May 24, 1983, 3318793
Int. Cl.[4] B04B *3/00, 11/00*
U.S. Cl. 494—52 **14 Claims**



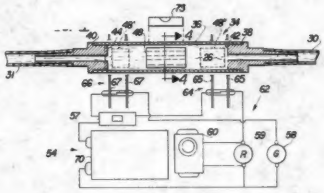
1. An apparatus for dewatering sludge in the centrifugal field of a solid jacket centrifuge comprising:
a centerfuge drum,
agitator elements situated within said centrifuge drum, said agitator elements including impelling means thereon,
means for causing relative movement between some of said agitator elements and others of said agitator elements in a direction parallel to the rotational axis of said centrifuge,
means for adjusting the amount of said relative movement between said agitator elements,
means for adjusting the rotational speed of said agitator elements, and
means for adjusting the angle of incidence of some of said agitator elements.

4,617,011

INTESTINAL IRRIGATION SYSTEM WITH FLOW INDICATOR

Ingrid B. Bloxom, Jr., P.O. Box 205, Islemorada, Fla. 33036

Continuation-in-part of Ser. No. 556,036, Nov. 29, 1983, Pat. No. 4,518,382. This application Apr. 2, 1985, Ser. No. 719,175
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—27 **18 Claims**



1. An apparatus for controlled intestinal irrigation and monitoring comprising:
(a) a container means for supply and storage of irrigating fluid,
(b) introduction means positionable adjacent to and in fluid delivering relation with an entrance to an intestine being irrigated for introducing liquid thereto,
(c) conduit means disposed in interconnecting and fluid communicating relation between said container means and said introduction means for defining a path of liquid flow therebetween,
(d) flow regulating means connected to said conduit means and structured and disposed to stop and control liquid flow from said container means to said introduction means, whereby flow of irrigating fluids to the intestine is selectively stopped by said flow regulating means upon an indication of peristaltic action of the intestine by a flow indicator,
(e) a flow indicator means including a flow channel for indicating direction of fluid flow within said conduit means, said flow channel connected to said conduit means between said container means and said introduction means, said flow channel structured to accommodate liquid flow therethrough from said container means to the intestine and reversely from the intestine into said flow indicator means,
(f) said flow indicator means including an indicator element movably disposed therein and within liquid flow passing therethrough,
(g) said flow channel comprising opposite ends each of which including an element seat disposed for abutting engagement with said indicator element and comprising a flow through construction to maintain said indicator element out of fluid sealing engagement therewith,
(h) said indicator element means cooperatively structured and disposed relative to said flow channel for responsive longitudinal displacement therein based on peristaltic action of the intestine during flow of liquid through said flow indicator means to the intestine,
(i) a monitoring means for determining direction of fluid flow through said flow channel into and out of said introduction means and including an indicator sensing means mounted adjacent said flow channel and structured for sensing the position of said indicator element within said flow channel,
(j) said sensing means further structured and disposed for electrical interconnection of a power supply to an indicator assembly and actuation of said indicator assembly

dependent upon said positioning of said indicator element within said flow channel relative to said sensing means,

(k) said indicator element including activating means thereon bring structured for activation of said indicator sensing means when in proximity thereof,

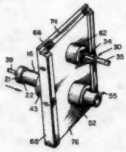
(l) whereby flow of irrigating liquid to the intestine is selectively stopped by said flow regulating means upon the development of peristaltic action of the intestine indicated by travel and positioning of said indicator element based on direction of fluid flow through said flow channel in a direction from said introduction means.

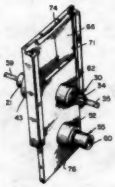
4,617,012

STERILE CONNECTOR WITH MOVABLE CONNECTION MEMBER

Vincent L. Vaillancourt, Livingston, N.J., assignor to Manresa, Inc., Hillsdale, N.J.

Filed Oct. 29, 1985, Ser. No. 792,460
Int. Cl.[4] A61M 5/00
U.S. Cl. 604—29 **42 Claims**





1. A connector apparatus having a retaining and guiding means which provides a movable transfer and alignment device adapted to receive and retain a separable connected fluid conductor having effluent and influent connector halves and, when said connection is brought to said transfer and alignment device, said effluent and influent connector halves are manipulated to effect separation, after which transfer is made and a positioning is effected to bring the effluent connector half into alignment with a new influent connector half and, with manipulation, the effluent and influent connector halves are connected to provide a fluid-tight conducting path, this connector transfer and alignment device including:

(a) first and second movable members arrayed in substantially a face-to-face relationship and adapted for movement from one determined position to another selected position;

(b) means for retaining said first and second movable members in said arrayed relationship during use;

(c) a guideway in said first movable member, said guideway sized and adapted to receive and slideably retain a body portion of the effluent connector half;

(d) a first guideway in said second movable member, said guideway sized and adapted to receive and rotatably and slideably retain a body portion of an influent connector half;

(e) a second guideway in said second movable member, this guideway sized and contoured to receive a rotatable sleeve member, said sleeve member being of a tubular configuration and having a stop flange to limit longitudinal movement, the sleeve member having an interior sized and adapted to receive and retain a body of an influent connector half, and

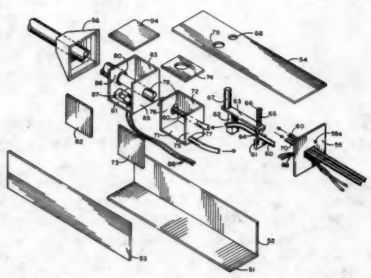
(f) stop means which provide two movement limits which determine said one determined position and said other selected position; whereby, in the first determined position the connected effluent and influent connector halves may be separated by manipulation and, while the halves are separated, the first and second movable members may be moved to the other selected position to align the first guideway of the second movable member, with a new influent connector therein, with the guideway in the first movable member and, through manipulation, connection of the now aligned connector halves may be achieved to establish a fluid flow path, and second movable members are moved so that the second guideway and sleeve containing an influent connector half are moved from in way of the now-separated effluent connector half in the guideway of the first movable member and this effluent connector half is repositioned so that said effluent connector half is aligned with the second guideway in the second movable member and the influent connector therein whereat, through manipulation, connection of the halves of the connector is achieved to establish a fluid flow path.

4,617,013

METHOD AND APPARATUS FOR SURGICAL IRRIGATION, ASPIRATION AND ILLUMINATION

John J. E. Betz, Reno, Nev., assignor to Timron Instruments, Incorporated, San Diego, Calif.

Continuation of Ser. No. 475,042, Mar. 14, 1983, abandoned.
This application Jan. 8, 1985, Ser. No. 689,511
Int. Cl.[4] A61M 7/00
U.S. Cl. 604—39 **21 Claims**



1. A device for probing a surgical incision which can be held in and operated by one hand and which is adapted to provide light and irrigating fluid to a surgical incision and to aspirate fluid therefrom comprising:

a. an elongated probe member having at or near the distal end thereof

i. a vacuum means for aspirating fluids from the surgical incision,

ii. a fluid supply means for providing irrigating fluid to the surgical incision, and

iii. a light means to illuminate the surgical incision; and

b. a housing member connected to the proximal end of the probe member capable of being held in the hand and provided with control means which can be operated by the hand holding the device during the use thereof, said housing having

i. a conduit means in fluid communication between a vacuum source and the vacuum means in the probe member, and

ii. a conduit means in fluid communication between a fluid source and the fluid supply means in the probe member;

said probe member being hollow and wherein said light

means includes an annular light conducting element disposed in said probe member; and wherein

said vacuum means includes a first tube disposed in said probe member within said annular light conducting element for providing a vacuum at the distal end of said probe member; and wherein

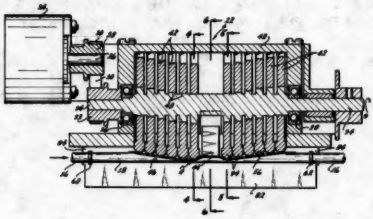
said fluid supply means includes a second tube disposed in said probe member within said annular light conducting element for supplying irrigating fluid at the distal end of said probe member.

4,617,014

DUAL MODE I. V. INFUSION DEVICE

Raymond E. Cannon, Poway, and Ted C. Bloomquist, San Diego, both of Calif., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Nov. 26, 1985, Ser. No. 801,987
Int. Cl.[4] A61M *31/00*
U.S. Cl. 604—67 **20 Claims**



1. A device for infusing I.V. medical fluids from a fluid source to a patient through an I.V. tubing having a compressible pumping section, which device comprises:

a case;

means for holding a portion of said compressible pumping section on said case;

peristaltic means mounted on said case and operatively engaged with said tube to sequentially squeeze said pumping section and produce at least one moving zone of occlusion along said pumping section for infusing fluids to the patient;

a gauge fixedly mounted on said case and operatively coupled with said pumping section, at a predetermined location thereon, for sensing fluid pressure in said pumping section at said location at a first time when said I.V. tube downstream from said location is patent and at a second time when said I.V. tube upstream from said location is patent;

means to determine a pressure differential between said first time and said second time; and

means to alarm and cease operation of said device when said pressure differential attains a predetermined value.

4,617,015

VISUAL PRESSURE INDICATOR FOR ENDOTRACHEAL CUFF

Carl L. Foltz, North Largo, Fla., assignor to Halkey-Roberts Corporation, St. Petersburg, Fla.

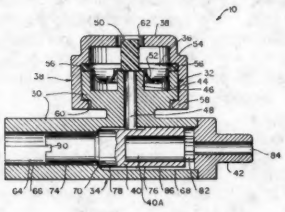
Filed Aug. 10, 1984, Ser. No. 640,074
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—100 **5 Claims**

1. An indicator for use in connection with an endotracheal tube having a cuff inflatable via a cuff tube, comprising in combination:

a rigid body including a diaphragm receiving portion;

a flexible diaphragm, said flexible diaphragm including an annular bellow integrally formed therewith to enhance the degree of movement of said stem upon flexing of said diaphragm;

means for sealingly positioning said flexible diaphragm within said diaphragm receiving portion to define an air space, said means including a cap positioned over said diaphragm and over at least a portion of said diaphragm receiving portion, said cap including an opening aligned with said stem to permit said stem to protrude therefrom upon flexing of said diaphragm;



means for connecting said air space in fluid communication with said cuff tube whereby said diaphragm flexes proportionally in response to pressure existing in the cuff tube and, correspondingly, in the cuff; and

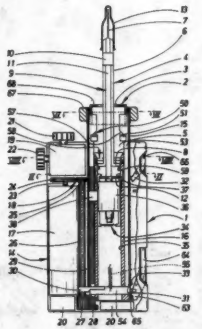
said diaphragm including a stem positioned to visually indicate the relative degree of pressure in the cuff tube.

4,617,016

INJECTION DEVICE

Anders Blomberg, P1 6238 Höglanda, S-434 00 Kungsbacka, Sweden

PCT No. PCT/SE82/00423, § 371 Date Jul. 19, 1983, § 102(e) Date Jul. 19, 1983, PCT Pub. No. WO83/02062, PCT Pub. Date Jun. 23, 1983
PCT Filed Dec. 13, 1982, Ser. No. 518,805
Claims priority, application Sweden, Dec. 14, 1981, 81074585
Int. Cl.[4] A61M *5/20*
U.S. Cl. 604—155 **7 Claims**



1. An injection device for medicine, comprising: an outer part forming a housing, and an inner part reciprocably supported in said outer part, said inner part having an opening and a cavity in communication with said opening; and an injection syringe having a barrel part having a first end and a second end, a syringe needle at said first end and a flange at said second end, a plunger part in said barrel part and having a plunger displaceably mounted in said barrel part for sucking medicine into said barrel portion and for injecting medicine from said barrel part, said injection syringe extending through said opening at least partly into said cavity, said inner part having a holding device for the barrel part, said holding device having means movable between a releasing position in which said barrel part is reciprocable in said cavity and a holding

position, in which said barrel part is held against movement in said inner part, said inner part also having a displacement device operatively connected to said plunger part and movable relative to said holding device in two directions relative to the barrel part, between a fore and a rear displacement position, said displacement device having gripping means movable between a releasing position and a gripping position and operable to release said plunger part in said fore displacement position of said displacement device and to grip the plunger part in other positions of the plunger part, said inner part being movable in said outer part between a rear position in which said syringe needle is positioned inside said opening and a fore position in which the syringe needle is outside said opening for insertion into body tissue, said injection device including a bottle holder positioned at said opening for positioning at least one medicine bottle for loading of said syringe, during which the syringe needle is inserted into a medicine bottle in said bottle holder and a predetermined amount of medicine is sucked into the barrel part, said injection device including an electric motor positioned in said outer part, an electronic control device in said outer part and operatively connected to said motor, and a transmission connecting said electric motor to said displacement device for effecting said displacement movements of said plunger part in a sequence determined by said control device, for loading the injection syringe and for injecting medicine into the body tissue.

4,617,017

PERSONAL CATHETER LEG STRAP

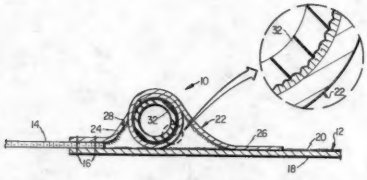
Vance M. Hubbard, Euless, and Welton K. Brunson, Bedford, both of Tex., assignors to Tencol, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 479,671, Mar. 28, 1983, Pat. No. 4,571,245. This application Sep. 18, 1985, Ser. No. 777,542

The portion of the term of this patent subsequent to Feb. 18, 2003, has been disclaimed.

Int. Cl.[4] A61M *25/02*

U.S. Cl. 604—179 **4 Claims**



1. Apparatus for securing any one of a plurality of differently sized catheter tubes to a portion of the anatomy of a patient adjacent a catheter insertion point, comprising:

a strap for wrapping about the desired portion of the anatomy of the patient, said strap having a first elastic portion for stretching and a second portion having a layer of fibrous material disposed on one side for receiving a Velcro-type attaching layer, said first and second portions each having an end joined to each other at a junction, said first and second portions each having a free end;

a strip of Velcro-type material attached to the free end of said first portion for mating with the free end of said second portion on said layer of fibrous material to form an attachment theretbetween;

a securing band attached at said junction having Velcro-type protruding members disposed on one side thereof, said securing band including a first portion having a circular orifice disposed therethrough adjacent the attached end and

a second portion integrally attached to said first portion proximate the orifice, the width of said second portion being less than the width of said first portion and being less than the diameter of said orifice through the entire length of said second portion;

said securing band operable to wrap around any one of a plurality of differently sized catheter tubes one revolution for insertion of said second portion through said orifice and further wrap around said one of said catheter tubes about one-half revolution for attachment of said protruding members to the fibrous material on the surface of said strap at any of a plurality of locations such that said one of said catheter tubes is secured against the surface of said strap vertically and laterally by said securing band providing a downward force on the catheter tube directed toward the strap , means for preventing axial and rotational movement of said tube formed on said one side of said securing band.

4,617,018

IRRIGATING CANNULA FOR EXTRACTING LENS NUCLEUS FOR USE IN EXTRACAPSULAR CATARACT EXTRACTION

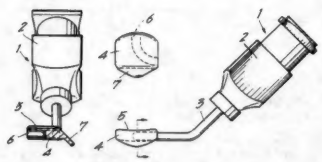
Okihiro Nishi, 3377, Oaza Hoshida, Katano-shi, Osaka, Japan

Filed Apr. 23, 1984, Ser. No. 602,843

Claims priority, application Japan, Nov. 18, 1983, 58-218377

Int. Cl.[4] A61M *5/325, 25/00*

U.S. Cl. 604—264 **6 Claims**



1. An irrigating cannula for extracting a lens nucleus in an extracapsular cataract extraction while providing a flow of irrigating liquid, said cannula comprising;

(a) a connector having a bore extending centrally therethrough;

(b) a small-diameter tube, the small-diameter tube having a bore extending therethrough, the tube having a proximal end secured to the connector and in fluid communication with the connector, the small-diameter tube having a distal end extending outwardly from the connector;

(c) an insertion piece attached to the distal end of the tube, the insertion piece extending both forwardly and laterally from the tube, to form a planar surface;

(d) the insertion piece having a base end attached to the small-diameter tube, a front end comprising a forward surface, a lateral side surface located between the front end and the base end, and an upper planar surface extending between the base end and the front end of the insertion piece;

(e) a bore within the insertion piece, the insertion piece bore extending from the base end of the insertion piece and in fluid communication with the bore of the small-diameter tube, the insertion piece bore having a lateral outlet on the lateral side surface of the insertion piece;

(f) a restraining piece provided at the base end of the insertion piece, the restraining piece projecting at an angle in the range of between 180 and 270 degrees to the planar upper surface of the insertion piece;

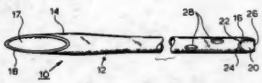
(g) the restraining piece serving to limit the extent to which the insertion piece is inserted beneath the nucleus and to apply a slight pressure on the sclera for easy delivery of the lens nucleus.

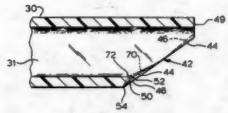
4,617,019

CATHETER

David C. Fecht, Manchester, and Thomas W. Davison, Chesterfield, both of Mo., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Sep. 28, 1984, Ser. No. 655,853
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—280 17 Claims





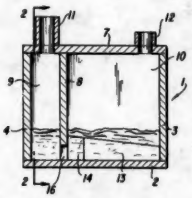
1. In a method of making a catheter, the steps of severing resilient flexible tubing including cutting the tubing generally in a plane at an angle to the longitudinal axis of the tubing to effect a distal end wall having a distal tip, a proximal wall portion, and a pair of opposed sidewalls connecting the distal tip with the proximal wall portion, and such that the proximal wall portion protrudes distally beyond the dista end of the tubing when the opposed end walls are pinched together adjacent the proximal end wall portion, and the tubing being in a substantially unflattened state at the cutting site when said step of severing is initiated, displacing a sufficient part of the proximal wall portion to substantially prevent the proximal wall portion from protruding distally beyond the distal end of the tubing when the sidewalls are pinched together adjacent the proximal end wall portion.

4,617,020

AIR LEAK DETECTOR AND COUNTER FOR DRAINAGE DEVICE

Robert J. Kurtz, New York, N.Y., assignor to BioResearch Inc., Farmingdale, N.Y.

Filed Oct. 18, 1984, Ser. No. 662,498
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—321 8 Claims



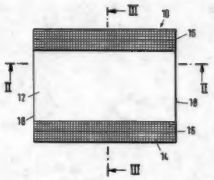
1. In a drainage device having a collection chamber for collecting fluids from a body cavity of a patient, means to drain fluid from a body, a bubble counter including detector means for detecting the passage of gas bubbles through fluid within the drainage device and means operatively connected to said detector means for measuring the time interval between bubbles.

4,617,021

ABSORBENT SURGICAL DRESSING, AND PROCESS FOR MANUFACTURING SAME

Helmut Leuprecht, Vienna, Austria, assignor to Rauscher & Co. Verbandstoff- und Wattefabriken, Vienna, Austria

Filed Nov. 8, 1984, Ser. No. 669,477
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1983, 3340530
Int. Cl.[4] A61F *13/16, 13/18, 13/20*
U.S. Cl. 604—365 5 Claims



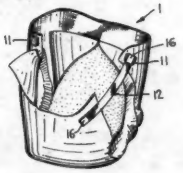
1. An absorbent surgical dressing comprising an absorbent pad disposed internally in an envelope which at least at the wound side has a non-sticking lattice structure, the absorbent pad being capable of slight movement within the interior of said envelope.

4,617,022

DISPOSABLE HYGIENIC ARTICLE WITH REMOVABLE BELT

Raymond Pigneul, Durrenentzen; Dominique Pannier, and Benoit Tresca, both of Colmar, all of France, assignors to Beghin-Say S.A., Thumeries, France

PCT No. PCT/FR85/00014, § 371 Date Sep. 25, 1985, § 102(e) Date Sep. 25, 1985, PCT Pub. No. WO85/03205, PCT Pub. Date Aug. 1, 1985
PCT Filed Jan. 25, 1985, Ser. No. 784,689
Claims priority, application France, Jan. 27, 1984, 84 01333; May 18, 1984, 84 07713; Nov. 6, 1984, 84 16844
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—391 22 Claims



1. A disposable hygienic article (1) consisting:

(a) of an absorbent pad (5) of substantially rectangular shape comprising two trunk areas (2) and (4) and a between-legs area (3) covered on its external face by a sheet (6) impermeable to liquids, such as a sheet of polyethylene, and on its internal face by a sheet (8) permeable to liquids at least in the central area (9), these two sheets being partially or completely bonded to one another along their longitudinal edges, a first attachment element (11, 11') being fixed near each longitudinal edge on the external face of a trunk area (4)

(b) and a means of attachment associated removably, consisting of a belt (12) provided at each end with a complementary second means of attachment (16, 16') of the first attachment element (11, 11')

characterized in that the other external area (4) and/or at least one area (13) of the belt coming into contact with this external trunk area is constituted in a manner such as to have a sufficient

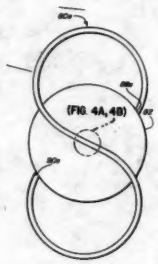
coefficient of friction such that when the article is in position it is maintained on the one hand by the cooperation of the first attachment elements and, on the other, by the friction of one on the other of the trunk area (4) and of said belt area (13).

4,617,023

INTRAOCULAR LENSES WITH OPENABLE HAPTIC LOOPS

Gholam A. Peyman, 535 N. Michigan Ave., Apt. 3001, Chicago, Ill. 60611

Filed May 2, 1983, Ser. No. 490,858
Int. Cl.[4] A61F *2/16*
U.S. Cl. 623—6 2 Claims



2. Intraocular lens for insertion inside the eye of a mammal comprising:

central lenticular means for refracting light entering the eye through the cornea before the light passes to the retina; and,

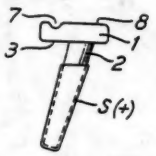
resilient haptic means for stabilizing and holding in place in the eye said central lenticular means having first and second ends of said resilient haptic means fixedly attached to said central lenticular means and generally forming a "figure-eight" configuration over said central lenticular means whereby said resilient haptic means can be severed generally over the center of said central lenticular means.

4,617,024

AUDITORY OSSICLE PROSTHESIS AND PROCESS FOR ITS MANUFACTURE

Heinz Broemer, Wetzlar-Hermannstein; Klaüs Deutscher, Wetzlar; Henning Franek, Braunfels-Tiefenbach, and Ralf Reck, Mainz-Bretzenheim, all of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Nov. 28, 1983, Ser. No. 555,347
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1982, 3211209
Int. Cl.[4] A61F *2/18*
U.S. Cl. 623—10 13 Claims



1. An auditory ossicle prosthesis, comprising: a generally planar plate; a shaft attached eccentrically to the underside of said plate; and a groove provided in the top side of the plate, wherein the plate and attached shaft have a mirror symmetrical configuration with respect to at least one symmetry plane perpendicular to the plane of the plate and passing through the shaft; the shaft is attached so that its contact surface with the plate is located on the symmetry plane of the plate, but is removed by at least one-half of the diameter of the shaft from the boundary area of the plate; the groove is arranged on the top side of the plate in its front half and is aligned perpendicular to the symmetry plane of the prosthesis; and wherein at least one of said plate and said shaft is comprised of a bioactive material and the prosthesis comprising at least one partial area of said bioactive material which has been selectively rendered bioinactive and which comprises an insoluble bioinert material for preventing ion exchange in vivo between the bioactive material and body fluids.

4,617,025

ESTER-CONTAINING HALOPOLYALKYLENES

Michael I. Naiman, St. Louis, and John A. Schield, Chesterfield, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Continuation of Ser. No. 626,831, Jul. 2, 1984, Pat. No. 4,536,191, and a continuation-in-part of Ser. No. 432,494, Oct. 4, 1982, abandoned, which is a continuation-in-part of Ser. No. 356,994, Mar. 11, 1982, Pat. No. 4,471,098. This application Apr. 22, 1985, Ser. No. 725,702

The portion of the term of this patent subsequent to Aug. 20, 2002, has been disclaimed.

Int. Cl.[4] C10L *1/20*

U.S. Cl. 44—62 1 Claim

1. A fuel oil containing an effective pour point depressing amount of ester-containing halopolyalkylene characterized by internal olefinic unsaturation, by being essentially free of cross-linking, by having a branch index of from about 2 to about 20 and wherein the percent of halogen replaced with ester groups can vary from about 1 to 100.

4,617,026

METHOD FOR IMPROVING THE FUEL ECONOMY OF AN INTERNAL COMBUSTION ENGINE USING FUEL HAVING HYDROXYL-CONTAINING ESTER ADDITIVE

Harold Shaub, Berkeley Heights, and Walter E. Waddey, Westfield, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 479,174, Mar. 28, 1983, abandoned. This application Aug. 15, 1984, Ser. No. 640,931

Int. Cl.[4] C10L *1/18*

U.S. Cl. 44—70 14 Claims

1. A method of reducing fuel consumption in an automotive internal combustion engine, which comprises operating said engine on a hydrocarbon fuel consisting essentially of a major amount of a liquid hydrocarbon of the gasoline boiling range, antioxidant, detergent, and/or corrosion inhibitor additive and from about 0.001 to about 2% by weight, based on the total weight of the fuel, of an additive which is an ester of an unsaturated monocarboxylic acid having about 12 to about 30 carbon atoms and a glycol or trihydric alcohol, said glycol being an alkane diol or oxa-alkane diol with said alkane being a straight chain hydrocarbon of about 2 to about 5 carbon atoms and said trihydric alcohol having a straight chain hydrocarbon structure of about 3 to about 6 carbon atoms, said ester having at least one free hydroxyl group, whereby said fuel including the ester additive effectively reaches the upper cylinder of said engine and thereby reduces the fuel consumed in the operation thereof.

4,617,027

GASIFICATION PROCESS

Robert J. Lang, Baytown, Tex., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 861,825, Dec. 19, 1977, abandoned. This application Aug. 17, 1982, Ser. No. 408,990

Int. Cl.[4] C10J *3/14*

U.S. Cl. 48—210 1 Claim

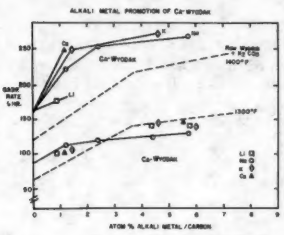
1. A process for gasifying coal to produce a fuel gas, which comprises:

(a) ion-exchanging from about 0.1 to about 10 atomic percent, based on carbon remaining in the char produced after said coal is pyrolyzed and devolatilized, of a Group II-A metal onto said coal by contact thereof with a solution of a Group II-A metal compound at a temperature within the range from about 20° F. to about 230° F.,

(b) separating the Group II-A ion-exchanged coal from said solution;

(c) admixing said Group II-A ion-exchanged coal with from about 0.1 to about 10 atomic percent, based on carbon remaining in the char produced after said coal is pyrolyzed and devolatilized, of a Group I-A metal compound; and then

(d) gasifying said treated coal at gasification conditions including a temperature within the range from about 750° F. to about 1850° F. in a gasification zone to produce fuel



gas, wherein the Group II-A metal is calcium, the Group I-A metal compound is a sodium compound or a potassium compound, and the coal is an Arkansas lignite.

4,617,028

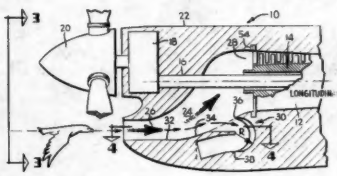
AIRCRAFT ENGINE AIR INTAKE INCLUDING A FOREIGN OBJECT SEPARATOR

Martin G. Ray, Marblehead, and Michael C. Harrold, Lanesville, both of Mass., assignors to General Electric Company, Lynn, Mass.

Filed Nov. 3, 1983, Ser. No. 548,382

Int. Cl.[4] B01D *45/16*

U.S. Cl. 55—1 21 Claims



1. For an aircraft engine, an air intake comprising:

an inlet duct having a first bend in a longitudinal plane defining a pressure side and being effective for channeling airflow to said engine, said inlet duct having a separator aperture disposed in said pressure side thereof; and

a receptacle extending from said inlet duct and being in flow communication with said separator aperture for receiving and capturing foreign objects which enter said inlet duct and pass through said separator aperture, said receptacle being substantially closed for preventing flow of said airflow therethrough and including a turning wall being substantially arcuate in a transverse plane and in said longitudinal plane to define a concave surface facing in an upstream direction, said transverse plane being disposed substantially perpendicularly to said longitudinal plane, for guiding foreign objects away from said separator aperture.

20. A method for separating foreign objects from airflow channeled to an aircraft engine comprising the steps of:

channeling substantially all incoming airflow to said engine through an unobstructed inlet duct having a bend in a longitudinal plane defining a pressure side; and

providing a substantially closed receptacle including a turning wall being substantially arcuate in a transverse plane and in said longitudinal plane to define a concave surface facing in an upstream direction, said transverse plane being disposed substantially perpendicularly to said longitudinal plane, for guiding foreign objects away from said separator aperture, and being in flow communication with a separator aperture disposed in said pressure side of said

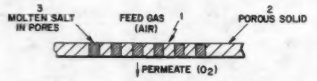
inlet duct for receiving foreign objects of higher inertia than said airflow which are unable to turn with said airflow channeled through said inlet duct.

4,617,029

METHOD FOR GAS SEPARATION

Guido P. Pez, Allentown, and Richard T. Carlin, Macungie, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 1, 1985, Ser. No. 707,298
Int. Cl.[4] B01D *53/22*
U.S. Cl. 55—16 **28 Claims**



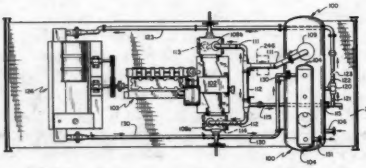
1. A process for separating a gas from at least one other gas in a mixture, comprising passing the mixture over a membrane selectively permeable to the gas being separated, which membrane comprises a thin, porous, inert support within the pores of which is immobilized an active material and the active material is a molten salt capable of undergoing one or more reversible oxidation-reduction reactions with the gas being separated.

4,617,030

METHODS AND APPARATUS FOR SEPARATING GASES AND LIQUIDS FROM NATURAL GAS WELLHEAD EFFLUENT

Rodney T. Heath, 109 W. 31st, Farmington, N. Mex. 87401

Continuation-in-part of Ser. No. 732,379, May 8, 1985, Pat. No. 4,579,565, which is a continuation-in-part of Ser. No. 537,298, Sep. 29, 1983, abandoned. This application Jan. 21, 1986, Ser. No. 821,026
Int. Cl.[4] B01D *19/00, 53/14*
U.S. Cl. 55—20 **24 Claims**



1. A system for processing relatively low volume natural gas wellhead effluent to separate heavy end hydrocarbon and water constituents from light end hydrocarbon constituents and produce sales gas consisting primarily of light end hydrocarbon constituents for delivery to a sales gas pipe line and a liquid body of hydrocarbons consisting primarily of heavy end hydrocarbon constituents for delivery to storage tank means, the system comprising:

a three phase relatively low pressure primary separator means for receiving the wellhead effluent and for separating light end hydrocarbons from heavy end hydrocarbons and water and for producing at temperatures in excess of gas hydrate temperatures a relatively low pressure body of gaseous hydrocarbons consisting primarily of light end hydrocarbons and a first body of liquid hydrocarbons consisting primarily of heavy end hydrocarbon components and a second liquid body consisting primarily of water components;

compressor means connected to said primary separator means for receiving a stream of relatively low pressure gaseous hydrocarbons from said primary separator means and for compressing said stream of relatively low pressure gaseous hydrocarbons while increasing the temperature thereof to provide a stream of compressed heated gaseous hydrocarbons having a temperature and pressure substantially in excess of the temperature and pressure of the wellhead effluent entering said primary separator means and the temperature and pressure of sales gas in the sales gas pipe line;

heat exchanger means mounted in said primary separator means for receiving said stream of compressed heated gaseous hydrocarbons and transferring heat of compression from said compressed heated gaseous hydrocarbons to said body of liquid hydrocarbons in said primary separator means;

cooler means connected to said heat exchanger means for receiving said stream of compressed heated gaseous hydrocarbons from said heat exchanger means and for reducing the temperature of said stream of compressed heated gaseous hydrocarbons and for providing a stream of reduced temperature relatively high pressure compressed gaseous hydrocarbons having a pressure substantially in excess of the pressure of said body of gaseous hydrocarbons in said primary separator means and approximately equal to or in excess of the pressure of the sales gas in the sales gas pipe line;

two phase relatively high pressure secondary separator means connected to said cooler means for receiving said stream of reduced temperature relatively high pressure compressed gaseous hydrocarbons from said cooler means and for separating light end hydrocarbons from heavy end hydrocarbons and for providing a body of sales gas hydrocarbons having a pressure substantially equal to or in excess of the pressure of the sale gas in the sales gas pipe line and consisting substantially of only light end hydrocarbons and a second body of liquid hydrocarbons consisting substantially only of heavy end hydrocarbon components;

gas pipe line outlet means connected to said secondary separator means for connecting and delivering said body of sales gas hydrocarbons to a sales gas pipe line;

liquid hydrocarbon collection tank means associated with said secondary separator means for collecting said second body of liquid hydrocarbons and being connected to said primary separator means for delivery of said second body of liquid hydrocarbons to said primary separator means for recycling therein including reduction of pressure causing flashing of light end hydrocarbons contained in said second body of liquid hydrocarbons and addition of flashed light end hydrocarbons to said first body of gaseous hydrocarbons in said primary separation means; and

condensate storage tank means connected to said primary separator means for receiving liquid hydrocarbons from said primary separator means.

4,617,031

HYBRID DOUBLE HYDROCYCLONE-GRAVITY GAS/LIQUID SEPARATOR

Sung L. Suh, Orinda; Carter B. Reeds, Walnut Creek; Peter Van Scherpe, Foster City, and William H. Silcox, San Francisco, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Feb. 26, 1985, Ser. No. 705,813
Int. Cl.[4] B01D *53/24*
U.S. Cl. 55—52 **12 Claims**

1. An apparatus for separation of a gas from a liquid in a multiphasic mixture, comprising:

an enclosing chamber having a generally cylindrical shape, and an axis through its center;

an outlet for allowing gas to leave the enclosing chamber;

an outlet for allowing liquid to leave the enclosing chamber;

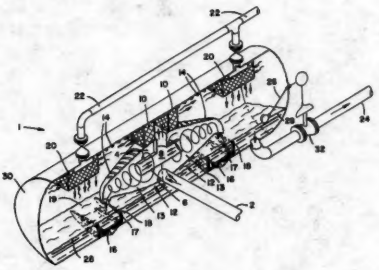
means to control the liquid outflow;

a generally smaller chamber within the enclosing chamber, constructed so that a space may be formed between both

chambers; the smaller chamber having an inner surface the shape of two cones which are joined at their bases, the bases of the cones being a common base and the axis of the cones being parallel to the axis of the enclosing chamber, the smaller chamber located generally in the center of the axis of the enclosing chamber;

an inflow line for pressurized well production fluid, the inflow line having an outlet located on the involute inner surface of the smaller chamber where the bases of the cones are joined;

a blade means for splitting the flow of production fluid into a stream for each conical section, the blade means being located at the inflow outlet;



two liquid outlets for the smaller chamber, the outlets being located at the point of each cone and directed downwards to the bottom of the enclosing chamber; and

a gas outlet for the smaller chamber; so that pressurized well production may enter the smaller chamber through the inflow line and spin on the inner surface of the smaller chamber to initially separate a gas fraction from a substantially liquid fraction, whereby the residual, substantially liquid phase may have the majority of the remaining gas separated by gravity while in the space between the smaller chamber and the enclosing chamber

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4,617,032

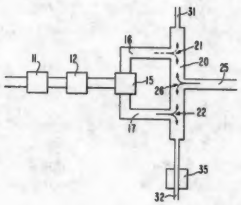
SAMPLE MODULATOR CELL FOR GAS CHROMATOGRAPHY

Gregory J. Wells, Suisun, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 548,816, Nov. 4, 1983, abandoned. This application Sep. 18, 1985, Ser. No. 777,569

Int. Cl.[4] B01D *15/08;* **G01N** *31/08*

U.S. Cl. 55—67 **18 Claims**



1. A method of obtaining an improved response to noise ratio in a chromatographic analysis of a sample by means of a sample modulator, comprising the steps of:

introducing said sample into a duct having two channels leading to a single exit passageway connected to a detector, periodically alternately introducing a carrier gas into said duct through two carrier gas inlets, said carrier gas inlets being positioned such that said sample gas is alternately directed to said two channels,

said channels being of unequal length so that there is a phase shift of 180° at the frequency of said periodic alternations of said carrier gas flow in said two channels.

5. A sample modulator for gas chromatography comprising a duct forming a closed circuit, said duct comprising:

two carrier gas input ports through which a carrier gas is introduced into said duct;

a sample input port positioned between said carrier gas input ports, through which a sample gas is introduced into said duct;

means for periodically switching a carrier gas input alternately between said carrier gas input ports;

a single exit port positioned between said carrier gas input ports through which all the carrier gas and all the sample gas entering the duct exits the duct, said exit port being removed from said sample input port, thereby defining two channels connecting said sample input port and said exit port.

4,617,033

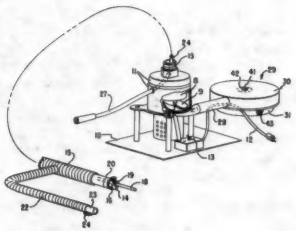
ARC WELDING FILTER

Virgil G. Strang, P.O. Box 327, Ocheyedan, Iowa 51354

Filed Dec. 7, 1984, Ser. No. 679,474

Int. Cl.[4] B03C *1/02*

U.S. Cl. 55—100 **6 Claims**



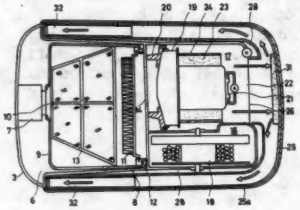
1. Means for cleaning the air round and the surface of a welding workpiece comprising a fan, housing means surrounding said fan and defining an inlet to said fan, flexible tubular means connected to said housing at said inlet for conducting air and entrained material to said inlet, electrical means located within said tubular means, said conducting means having one end adapted to be connected to a welding power supply, welding rod holding means located at the end of said tubular means opposite said fan inlet, said rod holding means being in electrical connection with said conducting means, said housing means also defining a discharge from said fan, filter means connected to said discharge to receive air from said fan and to filter said air, branch flexible tubular means leading away from said first named tubular means, and a nozzle on said branch tubular means opposite the juncture between the two tubular means, said tubular means being flexible so that said nozzle can be placed adjacent said rod holding means.

4,617,034

ELECTRIC CLEANER WITH MINIMUM NOISE

Katsuji Ikezaki, Sakai, and Kiyoshi Ishii, Nishinomiya, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 478,328, Mar. 24, 1983, Pat. No. 4,533,370. This application Jan. 31, 1985, Ser. No. 697,012
Claims priority, application Japan, Mar. 30, 1982, 57-53553; Apr. 8, 1982, 57-59436; Apr. 8, 1982, 57-59437; Apr. 8, 1982, 57-59438
The portion of the term of this patent subsequent to Aug. 6, 2002, has been disclaimed.
Int. Cl.[4] B01D *46/00*
U.S. Cl. 55—276 10 Claims



1. A cleaner comprising:

a housing;

an air blower within said housing for drawing air and accompanying particles into said housing, and filter means for removing particles from said air;

exhaust means for receiving air from said blower and for exhausting said air from said cleaner with a minimum of noise;

said exhaust means comprising an inlet portion adjacent one end of said housing for receiving said air from said blower, a plurality of outlet portions adjacent an opposite end of said housing for exhausting said air received by said inlet portion, and a plurality of air rectifying duct portions extending in a substantially linear manner for at least substantially the length of said housing from said inlet portion at said one end to said respective outlet portions at said opposite end, each air rectifying duct portion receiving a portion of said air received by said inlet portion of said exhaust means;

noise absorbing means within the inlet portion of said exhaust means where the air from the blower impinges against said exhaust means; and

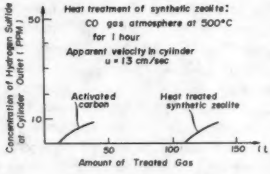
noise shielding means across each outlet portion of the exhaust means.

4,617,035

GAS ADSORBENT AND PROCESS FOR PRODUCING SAME

Akira Wakaizumi, Tokyo, and Hiroshi Kawakami, Yokohama, both of Japan, assignors to Nippon Sanso Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 28, 1984, Ser. No. 675,846
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—389 3 Claims



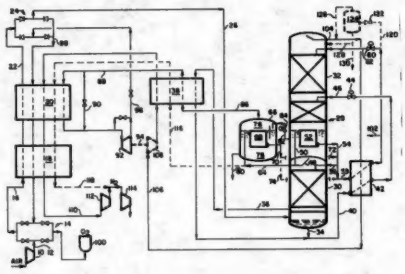
1. A gas adsorbent comprising either a zeolitic or silica-alumina adsorbent which has carbon particles ranging in size from about 0.01 to about 10 μm adhering on the surface and in pores thereof, said gas adsorbent being produced by heat-treating said adsorbent in a carbon-atom containing gas or a gaseous mixture consisting of a carbon-atom containing gas and an inorganic gas at a temperature of 100° C. to 700° C.

4,617,036

TONNAGE NITROGEN AIR SEPARATION WITH SIDE REBOILER CONDENSER

Shyam R. Suchdeo, Wescosville; Suresh U. Patel, Whitehall, and Christopher F. Harris, Old Zionsville, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 29, 1985, Ser. No. 792,423
Int. Cl.[4] F25J *3/00*
U.S. Cl. 62—11 11 Claims



1. A process for producing large quantities of nitrogen at relatively high pressure by the cryogenic separation of air in a two stage distillation column comprising the steps of:

(a) compressing a feed air stream to an elevated pressure and removing water and carbon dioxide from the compressed air;

(b) cooling the compressed air against rewarming process streams by indirect heat exchange;

(c) introducing at least a portion of the cooled air stream into the high pressure stage of said distillation column;

(d) removing a bottom stream from the high pressure stage of the distillation column, reducing its pressure and introducing it into the low pressure stage of the distillation column;

(e) removing a gaseous nitrogen stream from the top of the high pressure stage of the distillation column and condensing a portion of it against oxygen-enriched liquid in the bottom of the low pressure stage of the distillation column to produce a first liquid nitrogen stream;

(f) removing oxygen-enriched liquid from the bottom of the low pressure stage of the distillation column and reducing its pressure;

(g) condensing another portion of the gaseous nitrogen stream from the high pressure stage of step (e) against the oxygen-enriched liquid of step (f) to provide a gaseous oxygen-enriched stream and a second liquid nitrogen stream;

(h) returning a first portion of the first and/or second liquid nitrogen streams to the high pressure stage of the distillation column as reflux;

(i) reducing in pressure and introducing a second portion of the first and second liquid nitrogen streams to the low pressure stage of the distillation column as reflux;

(j) removing a gaseous nitrogen product from the low pressure stage of the distillation column, and

(k) rewarming the gaseous oxygen-enriched stream of step (g) and expanding it through an expansion turbine to produce refrigeration for the process by heat exchanging

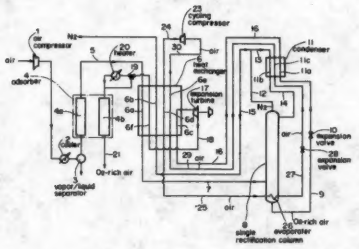
the expanded oxygen-enriched stream against process streams.

4,617,037

NITROGEN PRODUCTION METHOD

Hidetake Okada, Yokosuka, and Satoshi Urata, Ebina, both of Japan, assignors to Nippon Sanso Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 31, 1985, Ser. No. 793,156
Claims priority, application Japan, Nov. 2, 1984, 59-232126
Int. Cl.[4] F25J *3/00*
U.S. Cl. 62—11 6 Claims



1. A method for producing nitrogen wherein air is compressed, is removed of water and carbon contained therein, cooled to a temperature close to the liquefying point, is then fed into a rectifying column for rectification and from the overhead of said rectifying column high purity nitrogen is withdrawn; and wherein oxygen-enriched liquid air, fed from the bottom of said rectifying column, is expanded and fed into a condensation step whereafter said expanded oxygen-enriched liquid air is used as a source of reflux producing cold for said rectifying column and adiabatic expansion is effected on the evaporated gas to produce cold, so that heat exchange with raw air is conducted,

said method for producing nitrogen being provided with a closed cycle comprising the step of:

compressing a circulating gas;

cooling a compressed circulating gas by heat exchange with a circulating gas fed back into said compressing step;

vaporizing a bottom liquid in said rectifying column by supplying said cooled circulating gas into a reboiler at the bottom of said rectifying column to thereby liquefy the cooled circulating gas;

expanding said liquefied circulating gas;

thereafter feeding an expanded circulating gas into said condensation step to vaporize the same by heat exchange with said high purity nitrogen withdrawn from the rectifying column overhead;

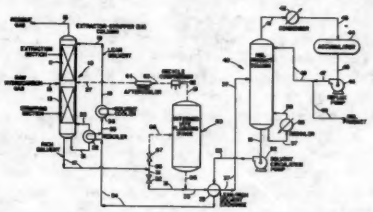
thereafter feeding said vaporized circulating gas into said cooling step before the same is fed back into said compressing step, to heat the same by heat exchange with said compressed circulating gas; and returning said heated circulating gas into said compressing step for circulation.

4,617,038

PROCESS FOR USING PREFERENTIAL PHYSICAL SOLVENTS FOR SELECTIVE PROCESSING OF HYDROCARBON GAS STREAMS

Yuv R. Mehra, Odessa, Tex., assignor to El Paso Hydrocarbons Company, Odessa, Tex.

Continuation-in-part of Ser. No. 759,327, Jul. 26, 1985, which is a continuation-in-part of Ser. No. 758,351, Jul. 24, 1985, which is a continuation-in-part of Ser. No. 637,210, Aug. 3, 1984, Pat. No. 4,578,094, which is a continuation-in-part of Ser. No. 532,005, Sep. 14, 1983, Pat. No. 4,526,594, which is a continuation-in-part of Ser. No. 507,564, Jun. 24, 1983, Pat. No. 4,511,381, which is a continuation-in-part of Ser. No. 374,270, May 3, 1982, Pat. No. 4,421,535. This application Oct. 4, 1985, Ser. No. 784,566
Int. Cl.[4] F25J *3/00*
U.S. Cl. 62—17 16 Claims



1. In a process for the removal of hydrocarbon gas liquids, comprising hydrocarbons heavier than methane, from a hydrocarbon gas stream, wherein a need exists for recovering to any selected degree and at extremely high recoveries a selected hydrocarbon component and heavier hydrocarbons within the group consisting of ethane, propane, butane, and pentane without the need simultaneously to recover hydrocarbons lighter than said selected hydrocarbon component from said hydrocarbon gas stream,

the improvement of selectively extracting said hydrocarbon gas liquids from said hydrocarbon gas stream with a preferential physical solvent which provides selective capability for recovery according to said selected degree of (a) ethane in amounts ranging from 2–98%, (b) propane in amounts ranging from 2–99%, (c) butane in amounts ranging from 2–100%, or (d) pentanes and higher molecular weight hydrocarbons in amounts ranging up to 100% which comprises:

A. selectively extracting and stripping said hydrocarbon gas stream with said physical solvent to produce a residue hydrocarbon gas stream of pipeline specifications and a rich solvent stream containing ethane and heavier hydrocarbon components, said physical solvent being selective for ethane and heavier hydrocarbon components of the gas stream such that: (1) the relative volatility of methane over ethane is at least 5.0 and the hydrocarbon loading capacity, defined as solubility of ethane in solvent, is at least 0.25 standard cubic feet of ethane per gallon of solvent, or (2) the preferential factor determined by the multiplication of relative volatility of methane over ethane by the solubility of ethane in solvent, in standard cubic feet of ethane per gallon of solvent, of at least 1.25; and

B. distilling said rich solvent to produce said hydrocarbon gas liquids and said physical solvent.

4,617,039

SEPARATING HYDROCARBON GASES

Loren L. Buck, Tulsa, Okla., assignor to Pro-Quip Corporation, Tulsa, Okla.

Filed Nov. 19, 1984, Ser. No. 673,039
Int. Cl.[4] F25J *3/02*
U.S. Cl. 62—26 11 Claims

1. In a process for separating a hydrocarbon gas containing

at least ethane and C_3 components into a fraction containing a predominant portion of the ethane and lighter components and a fraction containing a predominant portion of the C_3 and heavier components, in which process

(a) the feed gas is treated in one or more heat exchangers, and expansion steps to provide at least one partly condensed hydrocarbon gas, providing thereby at least one first residue vapor and at least one C_3-containing liquid which liquid also contains lighter hydrocarbons; and

(b) at least one of the C_3-containing liquids is directed into a distillation column wherein said liquid is separated into a second residue containing lighter hydrocarbons and a C_3-containing product;

the improvement comprising

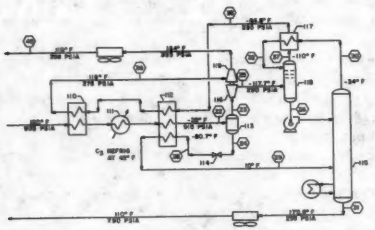
(1) cooling said second residue to partially condense it;

(2) intimately contacting at least part of one of said first residue vapors with at least part of the liquid portion of the partially condensed second residue in at least one contacting stage and thereafter separating the vapors and liquids from said contacting stage;

(3) supplying the liquids thereby recovered to the distillation column as a liquid feed thereto; and

(4) directing the vapors thereby recovered into heat exchange relation with said second residue from the distillation column, thereby to supply the cooling of step (1), and thereafter discharging said residue gases.

7. In an apparatus for separating a hydrocarbon gas containing at least ethane and C_3 components into a fraction containing a predominant portion of ethane and lighter components



and a fraction containing a predominant portion of the C_3 and heavier components in which apparatus

(a) one or more heat exchange means and one or more expansion means are provided which are cooperatively connected to provide at least one partly condensed hydrocarbon gas, providing thereby at least one first residue vapor and at least one C_3-containing liquid which liquid also contains lighter hydrocarbons and

(b) a distillation column connected to receive at least one of said C_3-containing liquids which is adapted to separate the C_3-containing liquids into a second residue containing lighter hydrocarbons and a C_3-containing product;

the improvement comprising

(1) heat exchange means connected to said distillation column to receive said second residue and to partially condense it;

(2) contacting and separating means connected to receive at least part of one of the first residue vapors and at least part of the liquid portion of the partially condensed second residue and to comingle said vapor and liquid in at least one contacting stage, which means include separation means for separating the vapor and liquid after contact in said stage;

(3) said means (2) being further connected to supply the liquids separated therein to the distillation column as a liquid feed thereto, and

(4) said means (2) also being connected to direct the vapors separated therein into heat exchange relation with said second residue from the distillation column in said heat exchange means (1).

4,617,040

HIGHLY PURE NITROGEN GAS PRODUCING APPARATUS

Akira Yoshino, Osaka, Japan, assignor to Daidousanso Co., Ltd., Osaka, Japan

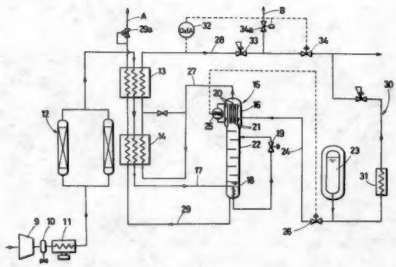
PCT No. PCT/JP84/00089, § 371 Date Nov. 6, 1984, § 102(e) Date Nov. 6, 1984, PCT Pub. No. WO84/03554, PCT Pub. Date Sep. 13, 1984

PCT Filed Mar. 7, 1984, Ser. No. 673,748

Claims priority, application Japan, Mar. 8, 1983, 58-38050; Jan. 11, 1984, 59-4123

Int. Cl.[4] F25J 3/04

U.S. Cl. 62—37 **12 Claims**



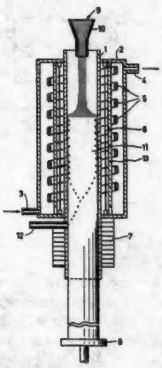
1. In an apparatus comprising means designed for producing highly pure nitrogen gas from the rectification of air, for precluding the need for a subsequent high-temperature catalytic step and for precluding the need of purging large quantities of cooling nitrogen, the combination which comprises means effective to compress the air taken from the outside, a means to remove the carbon dioxide gas and water in the compressed air by the said air compression means, a means to store liquefied nitrogen supplied from the outside, a heat exchanger connected to cool down the compressed air passed through said removing means to ultra low temperature, a rectifying column connected to turn a part of the compressed air cooled by the heat exchanger to ultra low temperature into liquid and to keep only nitrogen in gas form, said rectifying column having evaporating means for converting said liquid nitrogen to gaseous nitrogen, a lead channel connected lead consistently the liquefied nitrogen in said liquefied nitrogen storage means into said evaporating means as a source of cooling for compressed air liquefication in place of cold generated from a gas expander, a means to control the feed rate of said liquefied nitrogen in order to maintain constant rectifying conditions in said rectifying column which is provided to said lead channel, and an outlet channel connected to combine and remove both of the gasified said liquid nitrogen after use as the cooling source and also the gasified nitrogen from the outside source, pass them through said heat exchanger and heat them by exchanging heat with said compressed air, as the product nitrogen gas.

4,617,041

METHOD FOR CONTINUOUSLY MANUFACTURING ELONGATED BODIES STARTING FROM UNMOLTEN SOLID STARTING MATERIAL

Wilhelmus C. P. M. Meerman, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 549,118, Nov. 7, 1983, Pat. No. 4,546,484.
This application Jul. 16, 1985, Ser. No. 755,745
Claims priority, application Netherlands, Nov. 16, 1982, 8204438
Int. Cl.[4] C03B *37/02*
U.S. Cl. 65—2 5 Claims



1. A method for continuously manufacturing elongated bodies of glass comprising the steps of

continuously supplying starting material to a melt of glass material present in an upper part of a vertically arranged tube, said tube having cooled walls,

heating said melt in a heating zone by a high-frequency magnetic field,

blowing dry gas into said melt from below said heating zone to mix and dry said melt,

lowering said melt into a first zone of lower temperature to refine said melt by adjusting oxygen content,

solidifying said melt in a subsequent lower zone of said tube below said first zone, and

withdrawing solidified material of said melt from said tube at a speed corresponding to the rate of supplying said starting material.

4,617,042

METHOD FOR THE HEAT PROCESSING OF GLASS AND GLASS FORMING MATERIAL

David B. Stickler, Carlisle, Mass., assignor to Gas Research Institute, Chicago, Ill.

Filed Oct. 4, 1985, Ser. No. 783,964
Int. Cl.[4] C03B *5/16, 3/00*
U.S. Cl. 65—27 17 Claims

1. In the method of producing a glass product by heat processing glass batch material, the steps comprising:

(a) generating a first hot gas stream having a peak temperature substantially greater than the melting temperature of the glass product;

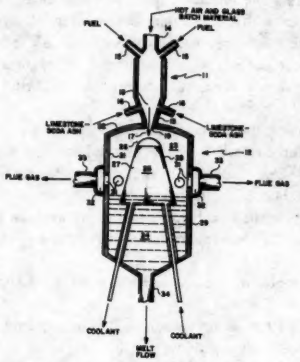
(b) entraining glass batch material in said first hot gas stream;

(c) causing said first hot gas stream and entrained glass batch material to form a second stream having a first line of symmetry;

(d) causing said second stream to be directed toward a first surface having a second line of symmetry substantially coincident with said first line of symmetry at a velocity and in a manner to form a gas flow field at about said first surface causing said entrained glass batch material to be separated from said second stream by contacting and being deposited on said first surface;

(e) causing said deposited material to flow from said first surface over a second surface to a collection region as a viscous layer having an exposed surface; and

(f) controlling the flow of said viscous layer and said second stream after leaving said first surface to cause gas entrapped or generated therein to immigrate to and leave the exposed surface of said viscous layer and simultaneously cause at least substantial reaction of glass batch materials comprising said viscous layer whereby mixing and glass forming reactions including the generation of gas in said viscous layer and elimination of gas therefrom substantially occur before reaching said collection zone.

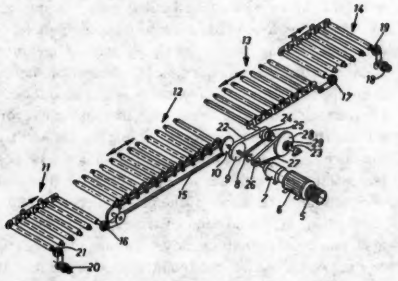


4,617,043

METHOD OF DRIVING A GLASS TEMPERING SYSTEM AND A GLASS TEMPERING SYSTEM FOR CARRYING OUT THE METHOD

Pauli T. Reunamäki, Nattari, Finland, assignor to O/Y Kyro A/B, Finland

Filed Aug. 5, 1985, Ser. No. 762,449
Claims priority, application Finland, Oct. 3, 1984, 843880
Int. Cl.[4] C03B *27/04*
U.S. Cl. 65—29 14 Claims



1. A method of driving a horizontal glass tempering system, said system including a loading section, a heating furnace including a thermally insulated chamber with heating means therein, a quench and cooling section having cooling equipment therein including air blowers, an unloading section, conveyors in each section and in the furnace, each conveyor being comprised of horizontal rollers transverse to the glass carrying

direction, drive mechanisms for the conveyors, clutch mechanisms for driving separate conveyors in unison or separately; the glass tempering system oscillating the rollers of the furnace conveyor back and forth while heating the glass sheets to a tempering temperature and oscillating the quench and cooling section conveyor back and forth while effecting the quenching of glass sheets; the method comprising the steps of:

oscillating the furnace conveyor mechanically coupled together with the quench and cooling section conveyor while quenching a glass sheet load in the quench and cooling section with the furnace being in an unloaded condition to reestablish a thermal equilibrium in the furnace;

uncoupling the quench and cooling section conveyor from the furnace conveyor to stop the former conveyor after a glass sheet load in the quench and cooling section has been quenched with the temperature in the center of glass sheets of the load being lower than the strain point of this particular glass raw material forming the glass sheet load; and

subsequently moving a fresh glass sheet load to be heated into the furnace.

5. A glass tempering system, said system comprising:

a furnace loading section;

a heating furnace including a thermally insulated chamber fitted with heating means;

a quench and cooling section including cooling equipment fitted with air blowers;

an unloading section;

conveyors in each section and in the furnace, each conveyor being comprised of horizontal rollers transverse to the glass carrying direction;

clutch mechanisms for selectively connecting and driving the separate conveyors in unison or separately;

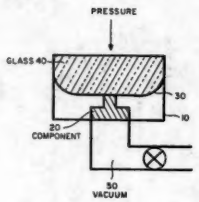
conveyor drive means, coupled with the furnace conveyor and the quench and cooling section conveyor, for driving each conveyor in a first operational cycle in an oscillating fashion and in a second operation cycle for effecting a long conveying stroke, said first operational cycle including first and second oscillation steps, said furnace conveyor and said quench and cooling section conveyor being coupled with each other by a mechanical coupling through a first clutch mechanism with a direct 1:1 transmission ratio during the first oscillation step for quenching of a glass sheet load in the quench and cooling section and for reestablishing a thermal equilibrium in the furnace with the furnace unloaded, said mechanical coupling being the same as the mechanical coupling used for effecting the long conveying stroke such that said conveyors of the furnace and the quench and cooling section oscillate at the same rate and the same stroke length in the first oscillation step, timing means for continuing the first oscillation step until the center of the glass sheets of the load is lower than the strain point of the particular glass sheet load, means for permitting movement of a glass sheet load on the loading section into the furnace after the first oscillation step, and in the second oscillation step, during which a glass sheet load passed into the furnace is oscillated in the furnace and a quenched glass sheet load is cooled to a suitable handling temperature, the quench and cooling section conveyor being mechanically coupled through another clutch mechanism with the furnace conveyor through a reduction gear having a transmission ratio of at least 10:1.

4,617,044

METHOD FOR FORMING GLASS-TO-METAL SEALS

Daniel P. Kramer, Dayton, and Richard T. Massey, Hamilton, both of Ohio, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 26, 1985, Ser. No. 769,210
Int. Cl.[4] C03C *27/02*
U.S. Cl. 65—49 4 Claims



1. A method for forming a glass-to-metal seal, comprising the steps of:

(a) placing in a vacuum injection mold a formed metal part to be sealed;

(b) heating a glass having a melting point greater than the melting point of said metal to a temperature greater than said glass melting point, thus melting said glass;

(c) vacuum injecting said molten glass into said mold to effect the seal.

4,617,045

CONTROLLED PROCESS FOR MAKING A CHEMICALLY HOMOGENEOUS MELT FOR PRODUCING MINERAL WOOL INSULATION

Boris Bronshtein, 6702 N. Newgard, Chicago, Ill. 60626

Filed Apr. 5, 1985, Ser. No. 720,562
Int. Cl.[4] C03B *5/16;* C03C *13/06*
U.S. Cl. 65—134 5 Claims

1. A controlled method for making a chemically homogeneous melt for producing mineral wool which comprises

(a) physically homogenizing a mixture of the following formula:

Ingredient	% By Weight
Bottom ash	5–30
Cement kiln dust	10–25
Mineral wool production waste	25–35
Slag (from steel making furnace)	7–24
Portland cement binder	3–6
the total weight equalling 100%	

(b) compacting said mixture into agglomerate pieces of predetermined size and shape to a density of 125 to 160 lbs./ft^3;

(c) melting said agglomerate in a cupola furnace;

(d) discharging the molten agglomerate into a receiver;

(e) passing hot combustion gases into said melt to chemically homogenize the melt and heat the melt to a predetermined temperature; and

(f) converting said melt into fibers.

5. A controlled method for making a chemically homogeneous melt for producing mineral wool which comprises

(a) physically homogenized a mixture of the following formula:

Ingredient	% By Weight
Bottom ash	5–30

-continued

Ingredient	% By Weight
Cement kiln dust	10–25
Mineral wool production waste	25–35
Slag (from steel-making furnace)	7–24
Binder	
Hydrated lime	3
Black liquor	5–6
Ground portion of said wool production waste (<50 microns)	5

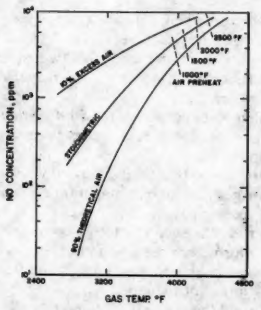
(b) briquetting said mixture into agglomerate pieces of predetermined size and shape to a density of 125 to 160 lbs./ft^3;
(c) melting said agglomerate in a cupola furnace;
(d) discharging the molten agglomerate into a receiver;
(e) passing hot combustion gases into said melt to chemically homogenize the melt and the heat the melt to a predetermined temperature; and
(f) converting said melt into fibers.

4,617,046

METHOD FOR THE HEAT PROCESSING OF GLASS AND GLASS FORMING MATERIAL

Finn A. Hals, Lexington, Mass., assignor to Gas Research Institute, Chicago, Ill.

Filed Oct. 4, 1985, Ser. No. 784,465
Int. Cl.^{4} C03B *5/10*
U.S. Cl. 65—134 **15 Claims**



1. In the method of controlling NO_x emissions from a combustion chamber for heat processing non-combustible particulate matter in which combustion of fuel produces products of combustion including NO_x compounds which is vented to the atmosphere, the steps comprising:
(a) introducing and burning in a combustion chamber a fuel and an oxidizer and producing therefrom products of combustion at a peak temperature greater than the temperature at which NO is formed and capable of forming a substantial amount of NO equilibrium concentration in said products of combustion at said peak temperature; and
(b) providing entraining and dispersing of noncombustible particulate matter to be heat processed in said products of combustion as a dispersed heat sink in a quantity to cool said products of combustion from its peak temperature at a rate sufficient to substantially kinetically limit the formation of NO in said products of combustion to a level which is a fraction of the said NO equilibrium concentration for said products of combustion at said peak temperature.

4,617,047

MUSHROOM SUPPLEMENT

Carl W. Bretzloff, deceased, late of Napoleon, Ohio (by Lillian Bretzloff, executrix), assignor to Campbell Soup Company, Camden, N.J.

Continuation-in-part of Ser. No. 402,314, Jul. 27, 1982, Pat. No. 4,534,781. This application Mar. 12, 1985, Ser. No. 711,006
Int. Cl.^{4} C05G *3/00*
U.S. Cl. 71—5 **8 Claims**

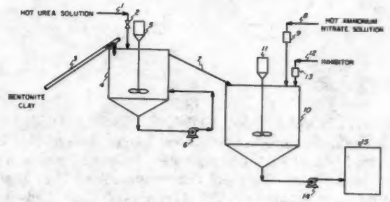
1. A method for enhancing the growth of mushroom mycelia in a compost bed comprising admixing into said compost, either at the time of spawning of the mycelia or up to the time of casing, an effective amount of a particulate nutrient supplement comprising the combination of a protein-containing nutrient and a mold inhibitory composition.

4,617,048

SODIUM BENTONITE-UAN SUSPENSION WITHOUT CHEMICAL DISPERSANTS

David G. Salladay, Decatur, and Donald L. Kachelman, Florence, both of Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Filed Aug. 26, 1985, Ser. No. 769,060
Int. Cl.^{4} C05C *9/00*
U.S. Cl. 71—30 **16 Claims**



MIX EQUIPMENT FOR UREA AMMONIUM NITRATE SUSPENSION WITH BENTONITE CLAY

10. A process for the direct production from urea solutions and bentonite clay of urea suspensions having excellent handling and storage characteristics including minimal extended time viscosity decreases, minimal extended time pourability decreases, and substantial freedom from post-production urea crystal growth, said urea-ammonium nitrate suspension being eminently suitable to production steps thereof at temperatures elevated as high as about 260° F., which process comprises the steps of:
(1) introducing into mixing means a stream of urea solution, said urea solution ranging from about 10 to about 88 weight percent urea and the temperature of said urea solution introduced into said mixing means ranging from about 32° to about 260° F.;
(2) introducing into said mixing means a stream of bentonite clay, said bentonite clay being sodium bentonite and being introduced into said mixing means in predetermined portions such that said bentonite clay comprises from about 0.5 to about 6.0 percent by weight of the combined urea solution bentonite composite;
(3) intimately mixing said streams of urea solution and bentonite clay in said mixing means to effect the homogeneous dispersion of said clay in said solution; and
(4) removing as product the resulting mixture of urea solution and bentonite clay as urea suspension;
said process characterized by the fact that the product produced therefrom has an initial viscosity ranging from about 100 cps to about 2000 cps at 70° F., has an initial pourability of at least about 95 percent by volume at 70° F., and after storage for a period of about one month exhibits decreases over said initial viscosity ranging from about 25 percent to 50 percent and

decreases in pourability ranging from substantially no decreases thereof to about 3 percent.

4,617,049

METHOD FOR PROTECTING PLANT LIFE FROM ACIDIC ATMOSPHERIC POLLUTANTS

Albin D. Lengyel, 2417 E. Indian School Rd., Phoenix, Ariz. 85064

Filed Aug. 22, 1985, Ser. No. 768,062
Int. Cl.[4] A01N *43/16*
U.S. Cl. 71—88 1 Claim

1. A method for treating a stand of coniferous trees growing by natural processes and exposed to an atmosphere containing inorganic nitric acid or nitrate compounds to improve the resistance of said trees to damage by acid rain, said method comprising the step of foliarly applying at least one sugar selected from the group consisting of monosaccharides and disaccharides to said coniferous trees naturally growing in said stand exposed to said atmosphere.

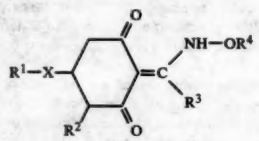
4,617,050

CYCLOHEXANE-1,3-DIONE DERIVATIVES

Dieter Jahn, Edingen-Neckarhausen; Rainer Becker, Bad Durkheim; Michael Keil, Ludwigshafen; Walter Himmele, Walldorf, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 496,644, May 20, 1983, abandoned. This application Jul. 2, 1985, Ser. No. 750,996
Claims priority, application Fed. Rep. of Germany, May 22, 1982, 3219315
Int. Cl.[4] A01N *37/44, 35/06;* C07C *131/02, 131/10*
U.S. Cl. 71—98 3 Claims

1. A cyclohexane-1,3-dione derivative of the formula



I

where R^1 is cycloalkyl of 3 to 12 carbon atoms which may or may not be olefinically mono-unsaturated, can be substituted by not more than 3 methyl or ethyl groups or by one vinyl, methylvinyl or allyl group, 1 or 2 chlorine atoms or one alkoxy group of 1 to 4 carbon atoms and can be bridged by an alkylene chain of not more than 4 carbon atoms, X is alkylene of 1 to 5 carbon atoms, which contains 1 or 2 heteroatoms selected from sulfur and oxygen, which may be mono-unsaturated and which may be substituted by 1 to 3 alkyl groups of 1 to 3 carbon atoms, R^2 is hydrogen or alkoxycarbonyl where alkoxy is of 1 to 2 carbon atoms, R^3 is alkyl of 1 to 4 carbon atoms, R^4 is alkyl of 1 to 3 carbon atoms, alkenyl of 3 or 4 carbon atoms, propargyl or haloalkenyl of 3 or 4 carbon atoms and 1 to 3 halogen atoms, or a salt thereof.

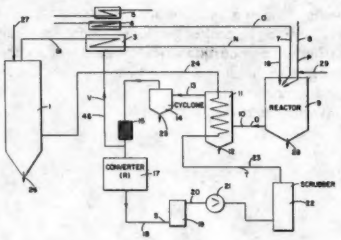
2. A herbicide containing conventional additives and, as active ingredient, from 0.5 to 90 wt% of a cyclohexane-1,3-dione derivative of the formula I as claimed in claim 1.

4,617,051

METHOD OF OPERATING A REACTOR FOR SYNTHESIS GAS PRODUCTION

Klaus Knop, Bottrop, and Peter Heinrich, Oberhausen, both of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 17, 1983, Ser. No. 505,330
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1982, 3223702
The portion of the term of this patent subsequent to Dec. 3, 2002, has been disclaimed.
Int. Cl.[4] C22B *5/12;* C10J *3/46*
U.S. Cl. 75—91 3 Claims



1. A method of operating a synthesis gas reactor for producing synthesis gas comprising:

supplying carbon containing material, oxygen gas and recycled gas to the synthesis gas reactor for producing a hot raw reactor gas;

supplying the hot raw reactor gas to a waste heat exchanger to heat the waste heat exchanger and cool the raw reactor gas;

removing ash from the cool raw reactor gas to produce ash-free raw reactor gas;

supplying a portion of the free-ash raw reactor gas to a recycled gas heater for operating the recycled gas heater to heat recycled gas;

branching off another portion of the ash-free raw reactor gas from the portion which was passed to the recycled gas heater;

converting the other branched off portion of the ash-free raw reactor gas in a high temperature converter to form converted reactor gas;

compressing the converted reactor gas and supplying it to a scrubber to form cool reduction gas;

passing the cool reduction gas through the waste heat exchanger to form hot reduction gas;

supplying ore and the hot reduction gas to a reduction reactor to form a reduction product and to form said recycled gas for said synthesis gas reactor; and

passing the recycled gas through the recycled gas heater after the recycled gas leaves the reduction reactor and before the recycled gas is supplied to the synthesis gas reactor to heat the recycled gas.

4,617,052

PROCESS FOR PREPARING A MOTHER ALLOY FOR MAKING AMORPHOUS METAL

Tomoo Takenouchi; Yoshiaki Ichinomiya, and Yoshiyuki Iwanami, all of Hokkaido, Japan, assignors to The Japan Steel Works Ltd., Tokyo, Japan

Filed Aug. 30, 1985, Ser. No. 771,078
Claims priority, application Japan, Jan. 28, 1985, 60-12489
Int. Cl.[4] C21C *33/00*
U.S. Cl. 420—117 10 Claims

1. A process for preparing a mother alloy for making a Fe-B-Si base amorphous metal, comprising the steps of:

providing a molten metal containing an iron source and ferrosilicon;
adding to the molten metal a mineral ore containing a boron oxide;
reducing a predetermined amount of the boron oxide in the molten metal by the reducing action of carbon or aluminum that is initially present in the metal or externally added together with the mineral ore, thereby dissolving said boron oxide as elemental boron in the molten metal;
removing the carbon or aluminum by supplying an oxidant; and
adjusting the contents of boron and silicon in the molten metal to be within a desired composition range.

4,617,053
METAL REINFORCED POROUS REFRACTORY HARD METAL BODIES

Louis A. Joó, Johnson City; Kenneth W. Tucker, Elizabethton, and Jay R. Shaner, Johnson City, all of Tenn., assignors to Great Lakes Carbon Corporation, Briarcliff Manor, N.Y.

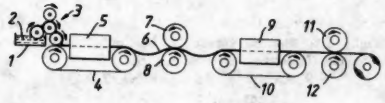
Filed Sep. 20, 1985, Ser. No. 778,456
Int. Cl.⁴ C22C *29/14*
U.S. Cl. 75—244 **2 Claims**

1. A refractory hard metal-metal article wherein the refractory hard metal is TiB_2 in which the TiB_2 is a porous solid with a continuous phase impregnated with a metal selected from the group consisting of iron, copper, aluminum and bronze.

4,617,054
PRODUCTION OF METAL STRIP

Roy Mathers, Clywd, Wales, assignor to Mixalloy Limited, Clywd, Wales

Filed Aug. 7, 1985, Ser. No. 763,543
Claims priority, application United Kingdom, Aug. 10, 1984, 8420327
Int. Cl.⁴ B22F *3/00*
U.S. Cl. 75—246 **9 Claims**



1. A process for producing strip from particulate metallic material which comprises forming a slurry comprising a suspension of particulate metallic material in a solution of water containing a film forming binder material, a ratio by weight of particulate metallic material to water of the slurry lying in a range of 3.4:1 and 4.2:1, depositing a coating of the slurry onto a support surface, removing the slurry coating after drying from the support surface in a form of a self-supporting green strip, and rolling the strip to effect compaction thereof.

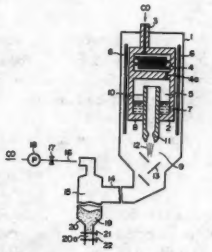
4,617,055
METAL CORED CERAMIC SURFACED FINE POWDER MATERIAL AND APPARATUS AND METHOD FOR MAKING IT

Hirohisa Miura; Hiroshi Satou; Toshio Natsume, and Hidenori Katagiri, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Division of Ser. No. 481,464, Apr. 1, 1983. This application Dec. 3, 1984, Ser. No. 677,469
Claims priority, application Japan, Apr. 2, 1982, 57-054873
Int. Cl.⁴ B22F *9/00*
U.S. Cl. 75—251 **10 Claims**

1. A ceramic-metallic composite fine powder material comprising: fine powder particles each having a metallic core and a ceramic surface layer which is a compound of the metal composing said core and another element, wherein the average value of the ratio of the thickness of the surface layer of a powder particle to the radius of the particle is substantially greater than 0.05, wherein said powder material is made by:

(a) mixing said metal in a gaseous form with said another element in the gaseous state, and



(b) passing the resulting mixture through a convergent-divergent nozzle, thereby rapidly cooling the mixture by adiabatic expansion.

4,617,056
THICK COATING COMPOSITIONS

Mark F. Mosser, Sellersville, and Bruce G. McMordie, Philadelphia, both of Pa., assignors to Sermatech International, Inc., Limerick, Pa.

Filed Dec. 29, 1983, Ser. No. 566,514
Int. Cl.⁴ C09D *5/00*
U.S. Cl. 106—1.12 **26 Claims**

1. A coating composition especially suitable for a machinable aluminum-filled thick coating possessing improved salt corrosion and oxidation resistance, which composition comprises a liquid binder which comprises phosphate ions and ions of the group of chromate or molybdate ions, and an atomized aluminum powder having a particle size distribution curve containing two peak frequencies which are attributable to the presence of a mixture of larger particle size powder having an average particle size greater than 15 μm in which the size distribution is such that at least about 5% by weight of the particles is retained on a 325 mesh screen and at most 50 weight percent of a mixture of smaller particle size powder, the two powders being in such ratio that the average particle size, medium equivalent spherical diameter (ESD), of the smaller to the larger powder is less than 0.5.

4,617,057
OIL AND WATER REPELLENT COATING COMPOSITIONS

Edwin P. Plueddemann, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jun. 4, 1985, Ser. No. 741,642
Int. Cl.⁴ C09K *3/18*
U.S. Cl. 106—2 **15 Claims**

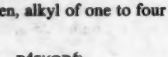
1. An oil and water repellent coating composition, comprising:

(a) a resin, selected from the group consisting of colloidal inorganic-based siloxane resin, poly(dialkylsiloxane)-monoorgano substituted silsesquioxane block copolymer, acrylic polymer and copolymer, ethylene-vinyl acetate latex and styrene-butadiene latex,

(b) an aminoorganosilane of the general formula

$$\begin{array}{l} HN-(R^2N)_n-R^4-Si(OR^6)_{3-m} \\ \quad\;\; | \qquad\;\; | \qquad\;\; | \\ \quad\;\; R^1 \qquad R^3 \qquad R_m^5 \end{array}$$

wherein R^1 is selected from the group consisting of hydrogen, alkyl of one to four carbon atoms or



R^2 is an alkylene group of two to four carbon atoms, R^3 is hydrogen or alkyl of one to four carbon atoms, R^4 is an alkylene group of three to four carbon atoms, R^5 and R^6 are alkyl groups of one to four carbon atoms each, n is zero to four and m is zero or one; and

(c) a perfluorinated organic compound of the general formula:

wherein R_f is a perfluoroalkyl group of four to 18 carbon atoms and Y is selected from the group consisting of —COOH, —COOR, wherein R is alkyl, alkoxyalkyl or hydroxyalkyl of one to eight carbon atoms;

wherein the combined amount of the aminoorganosilane and the perfluorinated organic compound comprises between about 0.1 and about 10 percent by weight of said resin and the molar ratio of the perfluorinated organic compound to the sum of primary and secondary amine group(s) in the aminoorganosilane is fixed between about 0.33 and about 1.0.

4,617,058

PROCESS FOR PRODUCING BLACKBOARD CRAYON

Seung J. Lee, 86-3, Hyomok-dong, Dong-ku, Daegu 635, Rep. of Korea

Filed Sep. 10, 1985, Ser. No. 776,166

Claims priority, application Rep. of Korea, Jan. 12, 1984, 1984-165

Int. Cl.[4] C09D *13/60*

U.S. Cl. 106—19 9 Claims

1. Process for producing blackboard crayon comprising the first step wherein the first coagulant is made from the mixture of paraffin, hardened oil, surface active agent and 3% glycerine solution, or the second coagulant from the mixture of beef tallow or palm oil, sodium hydroxide, magnesium oxide, surface active agent and water, and the second step wherein one of the first or the second coagulant or mixture of the two coagulants is, immediately after being made, mixed with the crayon material which is the mixture of calcium carbonate, titanium oxide and zinc oxide, and a solvent in order to be extrusion-molded as crayons.

4,617,059

DEMOLITION AGENT FOR BRITTLE MATERIALS

Yukinori Yamazaki, Tokyo, Japan, assignor to Nihon Cement Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 556,032, Nov. 29, 1983, abandoned. This application Apr. 11, 1985, Ser. No. 722,197

Int. Cl.[4] B02C *19/00*

U.S. Cl. 106—118 2 Claims

1. A demolition agent for brittle materials which is prepared by pulverizing a mixture containing limestone and phosphorus components together with SiO_2, Al_2O_3 and Fe_2O_3, calcining said mixture, and pulverizing resulting quick lime clinker, said demolition agent consisting of 0.5 to 10% by weight of phosphorous components in terms of P_2O_5, up to 4% SiO_2, up to 2% Al_2O_3, up to 2% Fe_2O_3, balance lime.

4,617,060

SILICA CATALYST SUPPORTS

John A. Dreibelbis, Wattsburg, Pa., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Continuation of Ser. No. 603,283, Apr. 23, 1984, abandoned, which is a continuation of Ser. No. 383,616, Jun. 1, 1982, abandoned, which is a continuation of Ser. No. 82,530, Oct. 9, 1979, abandoned. This application Jul. 19, 1985, Ser. No. 756,580

Int. Cl.[4] C08L *1/08;* C11C *1/04;* C11D *13/00*

U.S. Cl. 106—193 R 14 Claims

1. A method for the manufacture of silica catalyst supports comprising the steps of mixing precipitated amorphous silica powder having an average particle size in the range consisting essentially of about 10 to 50 millimicrons with a binder for said silica powder; forming the mixture of silica powder and binder into macrosized bodies suitable for use as a catalyst support; and calcining the said bodies of silica powder and binder.

4,617,061

MIXED PHASES HAVING THE COMPOSITION $Bi_{2-x}CR_xO_3$

Peter Köhler, Krefeld; Peter Ringe, Bergisch-Gladbach, and Heinrich Heine, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 511,040, Jul. 5, 1983, Pat. No. 4,529,448. This application Dec. 18, 1984, Ser. No. 682,974

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1982, 3226891; Apr. 30, 1983, 3315849

Int. Cl.[4] C04B *14/30;* C01G *37/14*

U.S. Cl. 106—302 2 Claims

1. A bismuth oxide-chromium oxide mixed phase pigment having a specific surface from about 1 to 10 m^2/g and the composition $Bi_{2-x}Cr_xO_3$ wherein x is from about 0.05 to 0.5.

4,617,062

ROOFING ASPHALT COMPOSITIONS CONTAINING HYDROCRACKED PITCH

Marc-Andre Poirier, Ottawa, Canada, assignor to Her Majesty in right of Canada as represented by the Minister of Energy, Mines and Resources, Ottawa, Canada

Filed May 14, 1985, Ser. No. 733,781

Int. Cl.[4] C08L *95/00*

U.S. Cl. 106—273 R 8 Claims

1. A roofing grade asphalt composition comprising a blend of:

(a) a processed residue boiling above 524° C. and obtained from high pitch conversion hydrocracking of hydrocarbon oils and

(b) as a diluent therefor a vacuum residuum having a penetration at 25° C. of 60–400.

4,617,063

CLEANING SILVER

Brian V. Morris, Britannic House, 28 St. Peters Road, Bournemouth, United Kingdom

Filed Mar. 11, 1985, Ser. No. 710,028

Claims priority, application United Kingdom, Dec. 4, 1984, 8430594

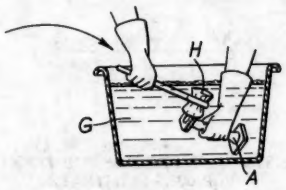
Int. Cl.[4] B08B *7/00*

U.S. Cl. 134—6 9 Claims

1. A method cleaning a silver article comprising placing at least one piece of perforate aluminium in a container having a non-metallic inner surface; adding hot water sufficient to cover the article to be cleaned; adding to the water an amount of sodium carbonate effective to clean the article; immersing the article in the water containing the sodium carbonate in contact with the aluminium for a brief period; removing the article from the container; and rinsing the article.

9. A method of cleaning a silver article comprising placing a thin sheet of aluminium with a regular pattern of holes in a

container having a non-metallic inner surface; adding hot water sufficient to cover the article to be cleaned; adding to the water about a dessertspoonful of household washing soda for each quart of water; immersing the article in the water in contact with the aluminium for a brief period; gently scrubbing



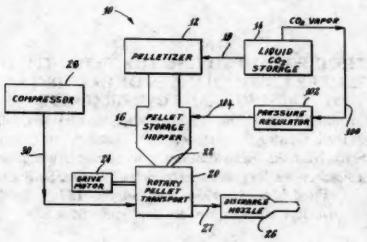
off long-ingrained tarnish while the article is immersed; removing the article from the container; rinsing the article in hot soapy water; rinsing the article with clear water; and, finally, polishing the article with a soft clean cloth to give a bright finish.

4,617,064

CLEANING METHOD AND APPARATUS

David E. Moore, Loveland, Ohio, assignor to Cryoblast, Inc., West Haven, Conn.

Filed Jul. 31, 1984, Ser. No. 636,372
Int. Cl.[4] B08B 7/00
U.S. Cl. 134—7 **26 Claims**



1. An improved particle-blast, cleaning apparatus comprising:

(a) a source of sublimeable pellets;

(b) housing means having pellet receiving and discharge stations;

(c) a rotary transport means having a plurality of cavities for receiving said pellets at said receiving station and transporting said pellets to said discharge station;

(d) means for providing gravity flow of said pellets to a cavity of said rotary transport means at said receiving station;

(e) a discharge nozzle; and,

(f) means for supplying a transport gas at high pressure to said discharge station for conveying said pellets from said discharge station to said discharge nozzle.

21. An improved method for transporting sublimeable pellets in a pellet blast cleaning apparatus comprising the steps of:

(a) rotating a body having a plurality of pellet transport cavities therein between a receiving station and a discharge station;

(b) providing a gravity feed of sublimeable pellets from a supply hopper to a cavity at said receiving station;

(c) rotating said body for transporting said pellets to said discharge station;

(d) flowing a transport gas at high pressure through said cavity at said transport station for discharging said pellets from said cavity; and

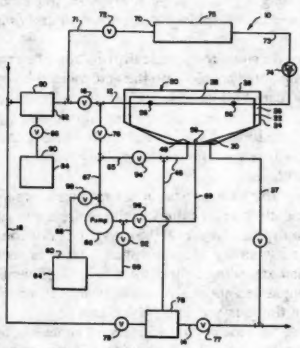
(e) conveying said pellets to a discharge nozzle.

4,617,065

METHOD FOR LIQUID DISINFECTING AND STERILE RINSING

Craig S. Sundheimer, Salt Lake City, Utah, assignor to American Sterilizer Company, Erie, Pa.

Division of Ser. No. 683,814, Dec. 20, 1984. This application Jan. 21, 1986, Ser. No. 820,346
Int. Cl.[4] B08B 3/04
U.S. Cl. 134—25.4 **5 Claims**



1. A method for disinfecting articles and the exterior and interior surfaces of the vessel in which the articles are disposed in an apparatus for use with a conventional supply of fluid, where the apparatus has an outer vessel and an inner vessel so disposed within the outer vessel that an outer chamber is defined therebetween, the method comprising:

placing the articles in the inner vessel of an apparatus having an inner vessel so disposed within an outer vessel that an outer chamber is defined therebetween;

washing the articles;

draining the inner vessel;

so applying a disinfectant to the articles that the disinfectant fills the inner vessel and flows through an interface between the inner vessel and a cover on the inner vessel to so fill the outer chamber that the inner vessel is submerged for a period of time sufficient to disinfect the articles, the inner vessel and the cover;

draining the inner vessel and the outer chamber;

spraying sterile fluid onto the articles;

so filling the inner vessel with sterile fluid that the articles are substantially submerged and the sterile fluid flows through the interface and over the exterior surface of the cover, establishing a direction of flow for preventing the entrance of contaminants into the inner vessel and rinsing the exterior surfaces of the cover, for a period of time sufficient to soak the articles;

agitating the sterile fluid within the inner vessel; and

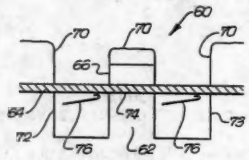
draining the inner vessel and the outer chamber.

4,617,066

PROCESS OF MAKING SEMICONDUCTORS HAVING SHALLOW, HYPERABRUPT DOPED REGIONS BY IMPLANTATION AND TWO STEP ANNEALING

Prahalad K. Vasudev, Santa Monica, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 26, 1984, Ser. No. 674,623
Int. Cl.[4] H01L *21/263, 21/225*
U.S. Cl. 148—1.5 20 Claims



1. A process for preparing a shallow, hyperabrupt interface between an undoped layer and a layer doped with a rapidly diffusing, activated species, in a crystalline near-surface layer of a base crystal, comprising the steps of:

amorphizing the near-surface layer of the base crystal to produce an amorphized layer of the underlying base crystal;

implanting a steep retrograde distribution of a rapidly diffusing implanted species into the amorphized layer, the retrograde distribution residing substantially entirely within the amorphized region, said step of implanting to occur at a temperature of the base crystal whereat the implanted species is essentially diffusionally immobile in the amorphized layer;

annealing the base crystal at a first annealing temperature sufficiently high to achieve solid phase epitaxial growth in the amorphized layer on the crystalline portion of the base crystal, whereby the amorphized layer is recrystallized, the first annealing temperature being sufficiently low that the implanted species is substantially diffusionally immobile in the recrystallizing layer; and

annealing the base crystal at a second annealing temperature greater than the first annealing temperature, for a time sufficient to activate the implanted species but not to permit large scale diffusion of the implanted species, thereby producing a shallow, hyperabrupt interface in the crystalline near-surface region of the base crystal.

4,617,067

PROCESS FOR THE PRODUCTION OF SEMI-FINISHED ARTICLES OF HARD STEELS USING A CONTINUOUS CASTING OPERATION

André Gueussier, Paris, France, assignor to Vallourec, Paris, France

Filed Aug. 6, 1981, Ser. No. 290,529
Int. Cl.[4] C21D *8/00*
U.S. Cl. 148—2 11 Claims

1. In a process for producing a semi-finished article from a blank of hard steel having a carbon content greater than about 0.75% wherein the blank is produced by a continuous casting process including a step of secondary cooling the continuous casting by subjecting the casting to a coolant distributed over the first half of the metallurgical casting height followed by cutting the casting to form the blank, the improvement comprising the steps of:

(a) subjecting the blank within about 1 minute to about 3 minutes after cutting from the casting to reheating to impart thereto a surface temperature which is between about θs less 80° C. and about θs less 110° C.;

(b) maintaining said reheating of (a) for a period of from about 10 minutes to about 30 minutes;

(c) transforming said reheated blank of (b) while in the hot condition by working to elongate the blank by a factor of at least 2; and

(d) maintaining the surface temperature of the blank throughout the transformation step higher than about θs less 140° C.

4,617,068

COMPOSITION AND PROCESS FOR TREATMENT OF FERROUS SUBSTRATES

Peter F. King, Farmington Hills, Mich., assignor to Parker Chemical Company, Madison Heights, Mich.

Division of Ser. No. 611,663, May 15, 1984, Pat. No. 4,496,404.
This application Jan. 11, 1985, Ser. No. 690,782
Int. Cl.[4] C23D *22/34*
U.S. Cl. 148—6.14 R 4 Claims

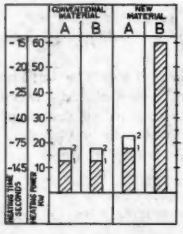
1. An aqueous acidic concentrate suitable for treating ferrous surfaces to inhibit surface corrosion thereof containing about 0.1 to about 5 g/l fluoride and aluminum in a weight ratio of aluminum to fluoride of at least 0.5:1.0.

4,617,069

METHOD FOR IMPROVING THE IMMUNITY TO TEMPERATURE CHANGES OF CAST IRON CONTAINING LAMELLAR GRAPHITE

Klaüs Hornüng, Stein a. Rhein; Anton Alt, Schaffhausen, both of Switzerland; Günter Schulte, Velbert, Fed. Rep. of Germany, and Fritz Mahnig, Schaffhausen, Switzerland, assignors to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Mar. 13, 1984, Ser. No. 589,127
Claims priority, application Switzerland, Mar. 14, 1983, 1373/83
Int. Cl.[4] C22C *37/00*
U.S. Cl. 148—138 5 Claims



1. A method of manufacturing a gray cast iron for a motor car part having improved immunity to temperature changes, consisting essentially of comprising annealing for up to three hours at 650° C. to 720° C. a cast iron which contains lamellar graphite, a grain structure of about 100% pearlite, and about 3.2% C, about 2.2% Si, about 0.056% P and about 0.3 to 0.5% by weight of at least one member of the group consisting of Cr and Mo and the remainder being Fe and whose saturation degree S is adjusted at <1 in accordance with formula $S=(\%C/4.3)-\frac{1}{3}(\%Si+\%P)$.

4,617,070

METHOD OF MAKING WEAR-RESISTANT CYLINDER, OR CYLINDER LINER SURFACES

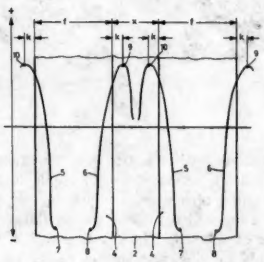
Welf Amende, Munich; Wolfram Lausch, Augsburg, and Hartwin Zechmeister, Munich, all of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Augsburg, Fed. Rep. of Germany

Filed Dec. 3, 1984, Ser. No. 677,172

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1983, 3343783

Int. Cl.[4] C21D *1/06*

U.S. Cl. 148—152 5 Claims



1. Method of improve the wear resistance of running surfaces of cylinders or cylinder liners, made of cast iron, for an internal combustion engine, in which the cylinder bore is machined to a diameter which is slightly less than the desired final diameter and the cylinder bore wall is subsequently hardened by impinging a laser beam thereon,

wherein

an absorption substance is applied to the surface of the cylinder bore which has the characteristic of lowering the reflection of laser light to provide for absorption of energy furnished by the laser beam, and the cylinder bore wall is hardened by impinging the laser beam on the cylinder bore and relatively moving the laser beam and the bore wall in a track pattern to obtain hardened tracks (4) in which the edge zones will have martensitic structure and, after hardening, the wall of the cylinder bore is honed to the final desired diameter,

wherein

the step of hardening the cylinder bore wall by the laser beams is carried out by guiding the laser beam in hardening tracks (4) extending parallel to each other along the wall (2) of the cylinder or the cylinder liner, and at an inclination with an acute angle (α) with respect to the axis of the cylinder (3),

said laser beam causing internal tension stresses to arise adjacent the hardening tracks within the material of the cylinder bore proximate to the cylinder bore walls;

and wherein the hardening tracks (4) are applied to leave a spacing or gap X between the edges of the two adjacent hardening tracks (4), which spacing is so dimensioned that the maxima (9, 10) of internal tension stresses occurring in the cylinder walls cannot overlap, said maxima of tension stresses being spaced by a distance L from the respective edges of the adjacent hardening tracks (4), and wherein X is greater than 2 k.

4,617,071

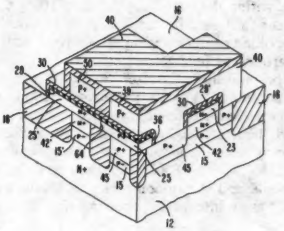
METHOD OF FABRICATING ELECTRICALLY CONNECTED REGIONS OF OPPOSITE CONDUCTIVITY TYPE IN A SEMICONDUCTOR STRUCTURE

Madhukar B. Vora, Los Gatos, Calif., assignor to Fairchild Semiconductor Corporation, Cupertino, Calif.

Filed Oct. 27, 1981, Ser. No. 315,553

Int. Cl.[4] H01L *21/441, 21/385*

U.S. Cl. 148—188 14 Claims



1. A method of fabricating electrically connected regions of opposite conductivity type in a substrate comprising:

depositing a layer of semiconductor material on the substrate, a first portion of the layer being first conductivity type, and a second portion of the layer being opposite conductivity type;

depositing a layer of electrically conductive material over the layer of semiconductor material; and

diffusing some of the first conductivity type impurity and some of the opposite conductivity type impurity from the layer of semiconductor material into the substrate to thereby create electrically connected regions of opposite conductivity in the substrate.

4,617,072

METHOD FOR PRODUCING A COMPOSITE CERAMIC BODY

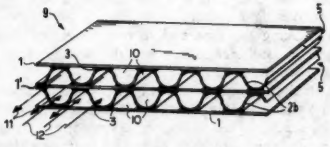
Herbert Merz, Munich, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 23, 1984, Ser. No. 633,870

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1983, 3327659

Int. Cl.[4] B32B *31/26*

U.S. Cl. 156—89 14 Claims



1. A method for manufacturing a ceramic body for use under thermal stress operating conditions, comprising the following steps:

(a) providing a first plane film made of a matrix material holding a carbon material content within the range of 50% to 80% by weight of said matrix material, said first plane film being in a still deformable state,

(b) providing a second profiled film also made of material including a carbon material content within said range, said second profiled film also being in a deformable state,

(c) arranging said first plane film on one side of said second

profiled film to form hollow spaces between said first and second films,

(d) bonding said first and second films to each other at bonding locations where said first and second films contact each other to form an intermediate member in which said hollow spaces are located between adjacent bonding locations,

(e) shaping said intermediate member into a desired final shape,

(f) curing the final shape,

(g) heating the final shape in an enclosed heater to a temperature within the range of 600° C. to 1000° C. while excluding air from said heater, said temperature being sufficient for coking or carbonizing said carbon material to provide a carbonized final form,

(h) exposing said carbonized final form to a silicon containing substance, which upon further heating will be decomposed to leave elementary silicon metal,

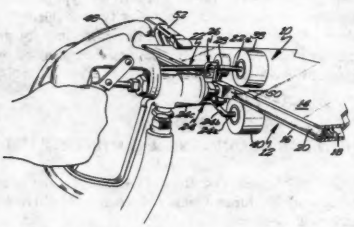
(i) and then further heating said carbonized final form including said silicon material to a temperature in the range of 1350° C. to 1800° C. sufficient to react the carbon material and the silicon metal to product silicon carbide (SiC) as an integral component of said ceramic body.

4,617,073

MOVEABLE CLAMP AND EDGE SEALING METHOD EMPLOYING SAME

Russell L. Scott, 1055 93rd Ave. N.W., Coon Rapids, Minn. 55433

Filed Sep. 12, 1985, Ser. No. 775,373
Int. Cl.[4] B32B *17/00, 31/00*
U.S. Cl. 156—107 **22 Claims**



1. Method of fabricating insulating glass comprising the steps of:

(a) providing a first sheet of glass having a first surface, an outside surface, and perimeter edges;

(b) providing a second sheet of glass having a first surface, an outside surface, and perimeter edges;

(c) providing a spacer;

(d) stacking the first and second sheets of glass with the spacer sandwiched between the first surfaces of the first and second sheets of glass;

(e) placing clamping forces on opposite perimeter edges of the stacked glass sheets and adjacent a perimeter edge of the stacked glass sheets to be sealed;

(f) providing a moveable clamp for placing a clamping force on the stacked glass sheets adjacent to the perimeter edge to be sealed;

(g) providing an applicator of a member for sealing the perimeter edges of the stacked glass sheets in a liquid form, with the liquid sealing member being delivered by a nozzle; and

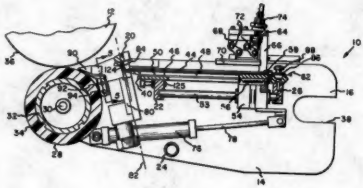
(h) moving the nozzle along the perimeter edge of the stacked glass sheets to be sealed and simultaneously delivering liquid sealing member between the perimeter edges of the stacked glass sheets to be sealed and pushing the moveable clamp along the perimeter edge of the stacked glass sheets to be sealed for preventing movement of the spacer between the first and second glass sheets during the application of the liquid sealing member between the first and second glass sheets.

4,617,074

APPARATUS AND METHOD FOR FEEDING STRIP MATERIAL FOR APPLICATION TO A DRUM

Steven J. Portalupi, Akron, and Robert S. Riggs, Stow, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 520,487, Aug. 4, 1983, abandoned. This application Mar. 14, 1985, Ser. No. 711,652
Int. Cl.[4] B29D *30/30*
U.S. Cl. 156—130 **6 Claims**



1. A method of feeding a strip of flexible material for application to a drum surface with an applicator roll rotatably mounted on an applier frame comprising:

(a) supporting said strip on a shuttle finger with a tongue portion of said strip adjacent an end of a shuttle casing;

(b) slidably moving said shuttle casing with said shuttle finger relative to said applier frame from a first position spaced from said applicator roll to a second position in close proximity to said applicator roll; and then

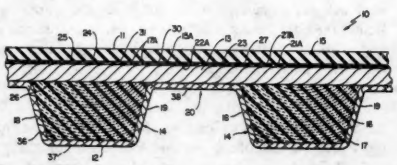
(c) slidably moving said shuttle finger relative to said shuttle casing from said second position toward said applicator roll to a third position to extend said tongue portion of said strip beyond said shuttle casing and onto said applicator roll.

4,617,075

METHOD OF MAKING A BELT

Robert E. Wetzel, and Richard L. Marsh, both of Springfield, Mo., assignors to Dayco Corporation, Dayton, Ohio

Filed Oct. 9, 1984, Ser. No. 658,832
Int. Cl.[4] B29H *7/22;* **F16G** *1/00*
U.S. Cl. 156—137 **11 Claims**



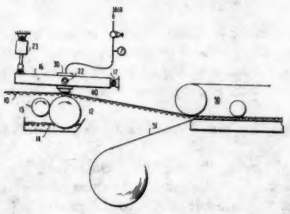
1. In a method of making a belt construction having opposed sides and comprising a plurality of teeth defining one of said opposed sides of said belt construction and being mainly formed of a first polymeric material that has reinforcing fibers therein, each tooth having opposed sides that are disposed in spaced relation to adjacent sides of adjacent teeth, said belt construction having a land area between adjacent teeth, and a backing member defining the other of said opposed sides of said belt construction, said backing member being mainly formed from a second polymeric material that is initially separate from said material of said teeth, said method comprising the steps of providing a grooved drum, disposing said first

polymeric material in a non-cured form thereof about said drum and then subjecting said drum with said first material thereon to heat and pressure to cause said first material to be forced toward said drum and exude into said grooves to at least partially form said teeth, the improvement comprising the steps of then substantially immediately force cooling said first material and said drum to a certain temperature to stop the curing of said first material so that said first material is generally in a less cured condition thereof than a cured condition thereof if said drum with said first material thereon had been permitted to cool to said certain temperature at a normal rate by being disposed in substantially static air of substantially normal room temperature, then disposing said second material in a non-cured form thereof about said first material on said drum, and then subjecting said drum with said first and second materials thereon to heat and pressure to cause said first and second materials to be forced toward said drum to complete any remaining unfinished portion of said teeth and be cured together to form said belt construction.

4,617,076
GLUE APPLICATOR FOR SINGLE-FACED CORRUGATED WEB

Thomas B. Jones, Jr., Etowah, Tenn., and Willem A. Nikkel, Covington, Va., assignors to Westvaco Corporation, New York, N.Y.

Filed Sep. 17, 1984, Ser. No. 651,580
Int. Cl.⁴ B32B *31/12, 31/20*
U.S. Cl. 156—205 **4 Claims**

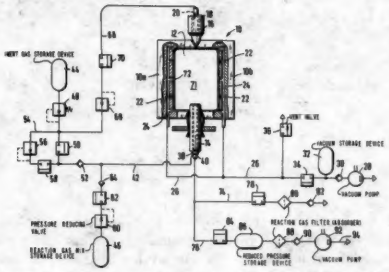


1. In combination with an apparatus for continuously applying a second facing web to an exposed face plane of corrugated flute tips forming a continuously produced line of single-faced, corrugated paperboard, a glue station having an adhesive applicator roll for applying adhesive to said exposed, corrugated flute tips, said glue station including backing force means for exerting a force bias on said single-faced production line to press said exposed flute tips against said adhesive applicator roll, said backing force means comprising pivoting arm means having a pivot end and a distally separated loading end, said pivot end being secured for pivotal freedom about an axis transverse of said production line, said loading end being secured to load maintenance means for supporting a substantially constant loading force at said loading end and air bearing means secured to said pivoting arm means between ends for transverse span of said production line for sustaining a substantially uniform pressure distribution of said force bias across the width of said single-faced production line.

4,617,077
BLOW MOLDING PROCESS

Peter Giese; Rainer Holzmann; Hans-Joachim Schwochert, all of Bonn, and Alfred Thomas, Dambroich, all of Fed. Rep. of Germany, assignors to Kautex-Werke Reinold Hagen AG, Bonn, Fed. Rep. of Germany

Filed Sep. 27, 1985, Ser. No. 781,435
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1984, 3435592
Int. Cl.⁴ B29C *49/46, 49/20*
U.S. Cl. 156—245 **15 Claims**



1. A process for the production of hollow bodies of thermoplastic material by blow molding comprising: forming a preform; initially expanding the preform within a blowing mold using an inert gas under high pressure thereby to cause the preform to bear completely against the inside surface of the blowing mold; reducing the internal pressure in the hollow body; treating the inside wall surface of the resulting hollow body within the blowing mold by introducing a reaction gas into the interior of the hollow body under a pressure which is substantially lower than the pressure used for intially expanding the preform, said reaction gas reacting with the plastic forming the inside wall surface of said hollow body thereby to render same at least substantially impervious; and after the necessary reaction time replacing the reaction gas by a flushing and cooling gas for substantially removing reaction gas constituents within the hollow body and for cooling thereof.

4,617,078
METHOD FOR SURFACE PRIMING IN ADHESIVE BONDING

Masaharu Takahashi, Gunma; Yuji Tokushige, Tokyo, and Kunio Itoh, Gunma, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Feb. 4, 1985, Ser. No. 697,792
Claims priority, application Japan, Feb. 6, 1984, 59-19774
Int. Cl.⁴ C09J *5/02*
U.S. Cl. 156—307.5 **2 Claims**

1. A method for surface priming in adhesively bonding a silicone rubber composition to the surface of a substrate which comprises treating the surface of the substrate with an organosilicon polymer having a silazane linkage in the molecule and represented by the average unit formula

$$R_aSiX_{(4-a)/2}$$

in which R is a hydrogen atom or a monovalent hydrocarbon group, not all of the atoms and groups denoted by R in a molecule being hydrogen atoms, X is a divalent atom or group selectd from the class consisting of an oxygen atom, an imino group, alkylene groups having 1 to 6 carbon atoms and a phenlyene group and a is a positive number in the range from 0.2 to 1.8, at least one of the atoms and groups denoted by R in a molecule being an aliphatically unsaturated hydrocarbon group and at least 10% by moles of the atoms and groups

denoted by X in a molecule being imino groups, and then contacting the treated surface with an unvulcanized silicone rubber composition and subjecting the composite thus formed to conditions to cure the composition.

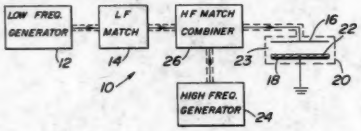
4,617,079
PLASMA ETCHING SYSTEM

David H. Tracy, Norwalk, and Brian G. Balistee, Bridgeport, both of Conn., assignors to The Perkin Elmer Corporation, Norwalk, Conn.

Filed Apr. 12, 1985, Ser. No. 722,623

Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00;* **C23F** *1/02*

U.S. Cl. 156—345 **8 Claims**



1. In combination with a plasma etching process including a planar reactor for producing plasma gas therein and a pair of electrodes with one of the electrodes disposed to receive thereon a wafer to be etched,

a source of power connected across said pair of electrodes comprising:

(a) a source of relatively low radio frequency signals having a predetermined output power for providing the main source of energy for etching said wafer;

(b) a source of relatively high radio frequency signals having a predetermined output power substantially lower than said source of said relatively low radio frequency signals;

(c) a combining circuit;

(d) means for applying said low radio frequency signals and said high radio frequency signals to said combining circuit; and

(e) means for applying the combined high and low radio frequency signals from combining circuit across said pair of electrodes.

4,617,080
FILM LAMINATING APPARATUS

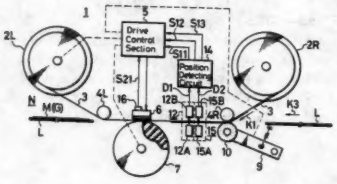
Youichi Kobayashi, Saitama, and Susumu Murakami, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 6, 1984, Ser. No. 679,051

Claims priority, application Japan, Dec. 9, 1983, 58-190968[U]

Int. Cl.[4] G05G *15/00*

U.S. Cl. 156—359 **9 Claims**



1. A film laminating apparatus in which a plurality of thermal-activation film layers are sequentially and detachably arranged with a predetermined spacing therebetween in a film web for delivery to a thermal transfer station along with a paper element, for transferring a film layer to respective ones of said paper element, said transfer station including a flat heater element connected for energization and a pressure roller operable for movement against and away from said heater element, said heater element and said pressure roller being arranged to receive said film web and said paper element therebetween, and said apparatus comprising:

optical position indicating means having an optical transmissivity different from an optical transmissivity of said film web and being arranged adjacent to a head and of each of said thermal-activation film layers;

optical position detecting means arranged at a predetermined spaced-apart location relative to said thermal transfer station for producing output signals indicating respective positions of siad film layers; and

controller means receiving said output signals from said optical position detecting means for operating said thermal transfer station and said transport mechanism in response thereto, whereby said film layers are thermally transferred to said paper element.

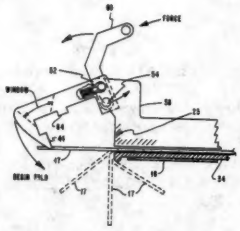
4,617,081
SIDE FLAP FOLD APPARATUS FOR A DISK ENVELOPE

Charles D. Bleau, 4374 NW. Fifth Ave., Boca Raton, Fla. 33431; Andrew Gasper, Jr., 3710 Kings Way, Boca Raton, Fla. 33434; Julius J. Perlini, 2591 SW. 11th St., Boynton Beach, Fla. 33435, and Alfred A. Stricker, 1903 Bay Dr., Pompano Beach, Fla. 33062

Filed Feb. 4, 1985, Ser. No. 698,212

Int. Cl.[4] B65C *1/00;* **B29C** *53/00*

U.S. Cl. 156—443 **12 Claims**



1. Apparatus for forming side flap folds in an envelope for a flexible disk from a flexible plastic prepunched blank having two connected sections one of which has side flaps extending from opposite side edges thereof comprising:

a frame;

a plate held by said frame and having an outwardly facing surface;

a mandrel having the flexible plastic blank folded about an end thereof so that said side flaps of the blank extend beyond the side edges of said mandrel;

said mandrel holding the plastic blank half having the flaps extending therefrom against the bottom surface of said plate;

a raised edge portion pxtending along the side edges of said mandrel on the outward facing surface thereof and having a predetermined height, width and a curved surface thereon;

a pair of folding blades each folding a flap around the adjacent side edge of said mandrel;

a pair of means located within said frame to guide said associated folding blade in an arcuate path to fold said associated flap around the adjacent edge of said mandrel;

drive means for rotating said folding blades about said pivot means in opposite directions;

stop means for stopping said folding blades arcuate path movement;

upward motion means associated with each of said pivot means and operable subsequent to said pivot means and said stop means operation in response to said drive means to cause compression of said flaps by said folding blades

beyond said raised edge portions providing an overfold zone adjacent said raised edge portions;

radiant heating means operable to anneal each of said folds relieving any stresses therein; and

guiding means for directing said radiant heat to said folds and shielding non-folded areas from the heat.

4,617,082

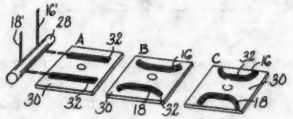
METHOD AND APPARATUS FOR APPLYING DISCRETE STRIPS TO A WEB OF MATERIAL

Daniel J. Oshefsky; Paul A. Gavronski; Robert E. Vogt, and Gregory J. Rajala, all of Winnebago County, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 673,064, Nov. 19, 1984, Pat. No. 4,578,133. This application Jan. 6, 1986, Ser. No. 816,487

Int. Cl.⁴ B65C *9/06;* **B32B** *31/00;* **B29B** *1/00;* **A23G** *1/20*

U.S. Cl. 156—447 **15 Claims**



1. Apparatus for applying discrete strips of a first material in a predetermined pattern to a web of second material comprises:

one or more transfer members carrying one of more flexible strip supports thereon;

supply means for supplying one or more discrete strips of the first material to the transfer members and adhering the discrete strips to the flexible strip supports;

adjusting means for changing the configuration of the flexible strip supports while the supplied strips of first material are adhered thereto, thereby correspondingly changing the configuration of the supplied strips; and

means to move the one or more transfer members and the web of second material into transfer contact with each other to transfer the discrete strips of first material from the strip supports to the web of second material.

4,617,083

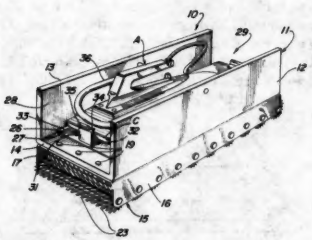
CARPET SEAMING TOOL

Raymond D. Yrizarris, 2931 E. 65th St., Long Beach, Calif. 90805

Filed Aug. 6, 1985, Ser. No. 762,926

Int. Cl.⁴ B30B *3/00*

U.S. Cl. 156—545 **10 Claims**



1. A tool for installing carpeting comprising:

(a) an elongated trough-like enclosure member having an elongated rectangular base of substantially uniform, U-shaped, transverse cross-sectional shape, elongated rectangular front and rear walls disposed perpendicularly upwards from the front and rear long edges, respectively of said base, and rectangular side openings,

(b) an elongated channel section of substantially uniform, inverted U-shaped, transverse cross-sectional shape having an elongated rectangular base of substantially the same size and shape as said enclosure member base, and elongated front and rear walls disposed perpendicularly downwards from the front and rear long edges, respectively, of said channel section, said channel section being fastened to said enclosure member base with the upper surface of said channel section in adjacent, parallel, concentric alignment with the lower surface of said enclosure base,

(c) a plurality of elongated cylindrical axles parallel to each other and to said channel base disposed underneath said channel section perpendicularly to said front and rear walls of said channel section and fastened thereto, and

(d) a plurality of circular discs, each said disc having spike-like members projecting radially outwards from the hub of said disc at regular polar angles, said discs being rotatably mounted on each said axle at regular intervals spanning substantially the distance between said front and rear walls of said channel section.

4,617,084

PROCESS FOR THE PRODUCTION OF METALLIC OR SEMIMETALLIC SHAPED ELEMENTS

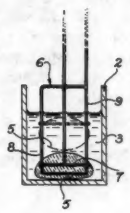
Claude Potard, St. Egreve, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 20, 1984, Ser. No. 632,799

Claims priority, application France, Jul. 29, 1983, 83 12548

Int. Cl.⁴ C30B *27/02*

U.S. Cl. 156—607 **9 Claims**



1. A process for the preparation of a shaped element composed of metallic or semimetallic material, comprising the steps of:

(a) placing the metallic or semimetallic material in a refractory confinement crucible, and bringing the metallic or semimetallic material to a molten state;

(b) placing a molten coating bath in said crucible, said coating bath being composed of a substance that is inert with respect to the metallic or semimetallic material, having a melting temperature below that of the metallic or semimetallic material, and having a density close to that of the metallic or semimetallic material at its melting point;

(c) introducing into the metallic or semimetallic material a frame, said frame being composed of a refractory material and having a thickness for wetting greater relative to the metallic or semimetallic material than relative to the molten coating bath and said frame defining an element area;

(d) producing a shaped element of the metallic or semimetallic material on the frame, said shaped element corresponding to the shape of said element area and being produced by slow displacement of all or part of the frame and solidification of the metallic or semimetallic material by cooling in the liquid coating bath; and

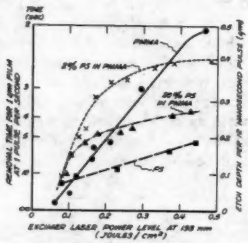
(e) removing the frame having the solidified shaped element from the bath.

4,617,085

PROCESS FOR REMOVING ORGANIC MATERIAL IN A PATTERNED MANNER FROM AN ORGANIC FILM

Herbert S. Cole, Jr.; Yung S. Liu, and Herbert R. Philipp, all of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 3, 1985, Ser. No. 771,956
Int. Cl.[4] B44C 1/22; B29C 17/08; C03C 15/00, 25/06
U.S. Cl. 156—643 7 Claims



1. A process for effecting the removal of organic material in a patterned manner from organic polymeric film by irradiating such organic polymeric film with ultraviolet light having sufficient power density to produce ablative photodecomposition, which comprises the improvement of using in such patterned organic material removal process, organic polymeric film which is a member selected from the class consisting of

(A) a blend of aliphatic organic polymer and aromatic organic material selected from the class consisting of aromatic organic polymer and aromatic organic monomer having from about 1% to about 20% by weight of the blend of such aromatic organic material, and

(B) organic polymer consisting essentially of from about 50% to 99% of aliphatic organic units chemically combined with from about 1% to 50% of aromatic organic units,

whereby the removal rate of such patterned organic material from such organic polymeric film under such irradiating conditions is substantially enhanced.

4,617,086

RAPID ETCHING METHOD FOR SILICON BY SF_6 GAS

Tung J. Chuang, Los Gatos; Frances A. Houle, Fremont, and Kurt E. Petersen, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 19, 1982, Ser. No. 360,027
Int. Cl.[4] B44C 1/22; C03C 15/00, 20/00; C23F 1/00; H01L 21/306
U.S. Cl. 156—643 8 Claims

1. A method of etching silicon comprising the steps of

providing an atmosphere of sulfur hexafluoride about said silicon, and

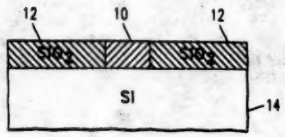
directing a continuous laser beam having a wavelength of about 0.6 or less microns at said silicon whereby said silicon absorbs light from said beam and is etched at a rate of the order of 45 microns per second.

4,617,087

METHOD FOR DIFFERENTIAL SELECTIVE DEPOSITION OF METAL FOR FABRICATING METAL CONTACTS IN INTEGRATED SEMICONDUCTOR CIRCUITS

Subramanian S. Iyer, and Rajiv V. Joshi, both of Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 27, 1985, Ser. No. 780,871
Int. Cl.[4] C23F 1/02; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—643 5 Claims



1. A method for the selective deposition of a metal onto a silicon substrate, having an apertured silicon dioxide mask layer thereon and located in a deposition chamber comprising the steps of:

the step of introducing a metal source gas into said chamber for reaction with said silicon substrate wherein said metal from said source gas substitutes for said silicon on said substrate surface to form a deposited metal layer in said apertures in said silicon dioxide layer on said silicon substrate,

the step of introducing hydrogen into said chamber with said metal source gas wherein said hydrogen reacts with said metal source gas to form a further deposition of said metal on said substrate surfaces including said previously deposited layer and said silicon dioxide layer,

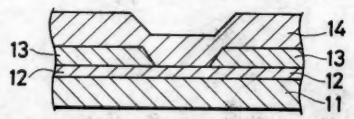
the step of introducing an etching gas into said chamber and activating the etching gas in said chamber for etching said metal being further deposited, said further deposition of said metal onto said previously coated metal layer surfaces being at a greater rate than said deposition onto said silicon dioxide layer surfaces such that said etching process selectively maintains said silicon surfaces free of metal while further metal deposition occurs on said previously coated metal layer surfaces.

4,617,088

THERMAL HEAD PRODUCING PROCESS

Yasuo Nishiguchi, and Keijiro Minami, both of Kagoshima, Japan, assignors to Kyocera Corporation, Kyoto, Japan

Division of Ser. No. 620,067, Jun. 13, 1984, Pat. No. 4,595,822.
This application Oct. 15, 1985, Ser. No. 787,726
Claims priority, application Japan, Jun. 14, 1983, 58-106918
Int. Cl.[4] C23F 1/02; B44C 1/22
U.S. Cl. 156—656 7 Claims



1. A process for producing a thermal head comprising the steps of:

preparing an electrically insulative substrate;

forming a resistive film comprising $TiO_x(0<x<2)$ on the electrically insulative substrate; and forming an electrode on the resistive film.

4,617,089

APPARATUS FOR DISCHARGING HIGH VISCOSITY MEDIA IN CHEMICAL ENGINEERING

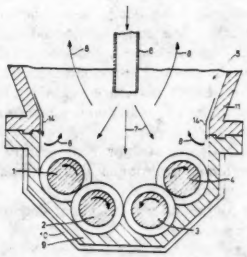
Martin Ullrich; Manfred Hederich, and Frank Wingler, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 483,546, Apr. 11, 1983, abandoned. This application Mar. 19, 1985, Ser. No. 713,615

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1982, 3215273

Int. Cl.[4] B01D *1/00*; B29B *7/48*

U.S. Cl. 159—43.1 7 Claims



1. An apparatus for collecting and discharging high viscosity strands comprising a multi-shaft screw pump including a collection tank, a group of at least four screw shafts arranged at the bottom of the collection tank in generally parallel relationship to one another, a circumferential portion of the shafts being confined by the collection tank with the remaining circumferential portion of the shafts freely exposed to open space within the tank, two adjacent shafts of the group at the bottom of the collection tank forming an inner central shaft pair with at least one shaft on each side thereof engaging one of the shaft pair, the central shaft pair extending axially beyond the collection tank into a downstream pressure build-up zone including discharge means, the pressure build-up zone having walls closely surrounding the axially extended central shaft pair, the diameter and the distance between the two central shafts arranged so that they do not intermesh in the collection tank, the axially extended central shafts having a greater diameter in the pressure build-up zone for engaging with each other, and means to rotate each shaft of the group in an opposite direction relative to an adjacent shaft in the group.

4,617,090

PROCESS FOR PRODUCING PERACIDS FROM ALIPHATIC HYDROXY CARBOXYLIC ACIDS

Helena L. Chum, Arvada; Matthew A. Ratcliff, and Peter D. Palasz, both of Lakewood, all of Colo., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 20, 1984, Ser. No. 684,099

Int. Cl.[4] D21C *9/16*

U.S. Cl. 162—16 6 Claims

1. In a wood pulp processing system of the type producing both pulp and a stream of lactic acid-containing black liquor solution, the processor for production of peracid bleaching agents from hydroxy acid contained in the black liquor solution, comprising:

adjusting the pH of said black liquor solution to the range of about 8–9 by exposing the solution to CO_2 carbon dioxide to form an alkaline precipitate;

separating solids from the black liquor solution to produce a residual solution containing lower aliphatic hydroxy acids selected from the group consisting of lactic acid, glycolic acid, 2-hydroxybutanoic acid, xyloisosaccharinic acid, and glucoisosaccharinic acid;

decarboxylating said lower aliphatic hydroxy acids to corresponding gaseous aliphatic aldehydes by admixing a powdered semiconductor with said residual solution to form a slurry, said semiconductor being selected from the group consisting of doped n-TiO_2, both platinized and unplatinized, n-WO_3, a-Fe_2O_3 and other insoluble semiconductors having bandgaps equal to or higher than a-Fe_2O_3, and then irradiating said slurry by a means for causing photoelectro-chemical reaction at the site of the semiconductor material resulting in decarboxylation of the carboxylic acid and produuction of CO_2 and corresponding aldehydes;

removing said gaseous aldehydes from the residual solution by sweeping gas flow as soon as they are generated to prevent further oxidation to carboxylic acids;

reacting said gaseous aldehydes with oxygen to form corresponding peracids; and

applying said peracids as bleaching agents to said pulp produced in the pulp processing system.

4,617,091

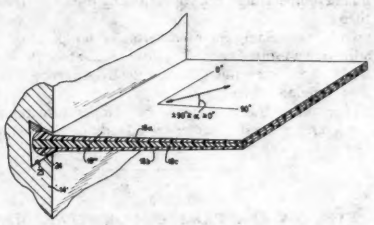
HEADBOX TRAILING ELEMENT

José J. A. Rodal, Rockton, Ill., and James L. Ewald, Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Continuation of Ser. No. 555,158, Nov. 25, 1983, abandoned. This application Sep. 11, 1985, Ser. No. 774,862

Int. Cl.[4] D21F *1/06, 1/02*

U.S. Cl. 162—343 23 Claims



1. In a headbox for delivering stock to a forming surface, the headbox having a slice chamber and a slice opening, the improvement compsrising:

a trailing element having planar stock-contacting surfaces extending continuously from side-to-side and from an upstream and to a downstream end of the element, said element positioned in the slice chamber for stock flow induced movement;

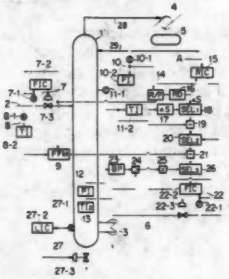
said element extending transversely of said headbox and consisting of material giving said element greater structural stiffness in the cross-machine direction than in the machine direction so that the element resists deflection in the cross-machine direction by transient pressure variations and offers low resistance to deformation in the fluid flow stream for balancing pressure forces on opposite sides of the element; and

means anchoring said elements in the slice chamber at an upstream portion with the downstream portion unattached and constructed to be self-positionable so as to be responsive to forces exerted thereon by the stock flowing over the surface of the element.

4,617,092
PROCESS FOR CONTROLLING A DISTILLATION COLUMN

Teruaki Hiramatsu, Omiya, Japan, assignor to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed Aug. 9, 1984, Ser. No. 655,192
Claims priority, application Japan, Aug. 9, 1983, 58-144483
Int. Cl.[4] B01D 3/42
U.S. Cl. 203—1 1 Claim



1. A process for controlling a distillation column, which includes heating a feed liquid supplied thereto by steam, comprising the steps of:

(a) comparing a bottom temperature of the column with a calculated boiling point temperature of the bottom liquid and increasing the steam flow rate when the bottom temperature is lower than the calculated boiling point temperature, until the bottom temperature is greater than the calculated boiling point temperature; then

(b) while maintaining the bottom temperature greater than the calculated boiling point, adjusting the temperature at an intermediate tray of the column to within a predetermined temperature range by adjusting the steam flow rate; then

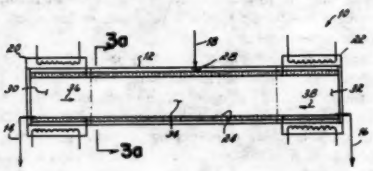
(c) while maintaining the predetermined temperature range, adjusting a ratio of the reflux flow rate to feed flow rate to within a predetermined ratio range by adjusting the steam flow rate; and then

(d) maintaining the predetermined temperature range and predetermined ratio range by adjusting the steam flow rate.

4,617,093
METHOD AND APPARATUS FOR SEPARATING COMPONENTS OF A MIXTURE

Sun-Tak Hwang, Cincinnati, Ohio, assignor to University of Cincinnati, Cincinnati, Ohio

Filed Feb. 8, 1984, Ser. No. 578,087
Int. Cl.[4] B01D 3/04, 15/00
U.S. Cl. 203—100 14 Claims



2. A method of distillation for continuously separating a more volatile component from a less volatile component of a mixture, comprising the steps of:

continuously introducing said mixture into a heat pipe structure having capillary means capable of inducing a capillary flow of components in condensed phase independently of gravity;

producing a temperature differential in said heat pipe structure forming a zone of higher temperature, a zone of lower temperature and an adiabatic zone between said zones of higher and lower temperature;

inducing by said temperature differential a countercurrent movement of said components within said heat pipe structure, said more volatile component in vapor phase moving toward said zone of lower temperature, and said less volatile component in condensed phase moving along said capillary means toward said zone of higher temperature;

establishing a steady state of operation wherein said mixture is continuously introduced into said heat pipe structure at said adiabatic zone, and wherein said more volatile component collects in concentrated form at said zone of lower temperature, and said less volatile component collects in concentrated form at said zone of higher temperature; and

continuously removing said components from said heat pipe structure.

4. Distillation apparatus for continuously separating one component of a mixture from another component comprising:

a heat pipe structure;

means for continuously introducing said mixture into said heat pipe structure;

means disposed within said heat pipe structure capable of inducing a capillary flow of liquid therealong independently of gravity;

means for heating one zone of said heat pipe structure;

means mounted exteriorly of said heat pipe structure for cooling another zone of said heat pipe structure;

one of said components being vaporized at said heated zone of said heat pipe structure and migrating in vapor form toward said cooler zone of said heat pipe structure;

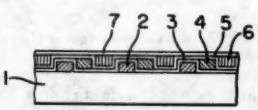
the other of said components being condensed at said cooler zone of said heat pipe structure and migrating in liquid form along said means for inducing capillary flow toward said heated zone of said heat pipe structure; and

means for continuously removing said one component from said heated zone of said heat pipe structure, and for continuously removing said other component from said cooler zone of said heat pipe structure.

4,617,094
METHOD OF MANUFACTURING SOLID STATE COLOR FILTER DEVICE USES CO-ELECTRODEPOSITION

Hitoshi Kamamori; Mitsuru Suginoya; Koji Iwasa; Yutaka Sano, and Yumiko Terada, all of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Jul. 24, 1984, Ser. No. 633,864
Claims priority, application Japan, Aug. 4, 1983, 58-142882
Int. Cl.[4] C25D 13/02, 13/06
U.S. Cl. 204—18.1 11 Claims



1. A method of manufacturing a color filter comprising the steps of: providing a substrate; forming plural transparent electroconductive layers spaced apart and insulated from one another on the substrate; forming on the substrate a layer of light-absorbent material in the spaces between the spaced-apart electroconductive layers; and forming a colored layer on the electroconductive layers by co-electrodepositing a coloring material and polymer on the electroconductive layers.

4,617,095

ELECTROLYTIC POST TREATMENT OF CHROMIUM SUBSTRATES

Thaddeus W. Tomaszewski, Dearborn, Mich., assignor to OMI International Corporation, Warren, Mich.

Filed Jun. 24, 1985, Ser. No. 747,599
Int. Cl.[4] C25D 11/36, 11/38
U.S. Cl. 204—41 12 Claims

1. A process for improving the corrosion resistance of a chromium-plated substrate which comprises the steps of contacting the chromium substrate with an aqueous solution which consists essentially of a solution soluble hexavalent chromium compound selected from the group consisting of chromate, in an amount of about 2.5 grams per liter up to its limit of solubility in the solution, dichromate, in an amount of about 4.5 grams per liter up to its limit of solubility in the solution and mixtures thereof, phosphate ions in an amount of about 2.5 grams per liter up to the limit of solubility in the solution, metal ions selected from the group consisting of nickel ions, cobalt ions, and mixture thereof present in an amount of 0 to about 2 grams per liter, hydrogen ions in amount to provide a pH of about 2.5 to about 10 and a buffering agent in amount at least sufficient to maintain the pH within the desired range up to about 60 grams per liter; cathodically electrifying the substrate at a cathode current density below that at which metallic chromium is deposited on the substrate to effect current to pass through the solution between an anode and the substrate for a period of at least five seconds to deposit on the substrate a protective film of the desired thickness.

12. The process as defined in claim 1 in which the chromium plated substrate comprises a substrate having a chromium plate electrodeposited from a trivalent chromium electrolyte overlying an underlying nickel plating.

4,617,096

BATH AND PROCESS FOR THE ELECTROLYTIC DEPOSITION OF GOLD-INDIUM ALLOYS

Werner Kuhn, Rodenbach, and Wolfgang Zilske, Hanau, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 28, 1986, Ser. No. 823,293
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1985, 3505473
Int. Cl.[4] C25D 3/62
U.S. Cl. 204—44.3 18 Claims

1. A bath suitable for the electrolytic deposition of a gold-indium alloy coating at a pH below 3 consisting essentially of water, 1 to 20 g/l gold in the form of at least one member of the group consisting of alkali and ammonium tetracyanoaurates (III), 0.5 to 50 g/l indium in the form of a water soluble indium salt, in acid, a buffer or conducting salt and 0.5 to 10 mg/l of at least one member of the group consisting of selenium and tellurium, in the form of selenious acid, telluric acid, an alkali selenite or an alkali tellurite.

4,617,097

PROCESS AND ELECTROLYTE FOR ELECTROPLATING TIN, LEAD OR TIN-LEAD ALLOYS

Fred I. Nobel, Sands Point; Barnet D. Ostrow, Roslyn, and David N. Schram, Freeport, all of N.Y., assignors to LeaRonal, Inc., Freeport, N.Y.

Continuation-in-part of Ser. No. 564,516, Dec. 22, 1983, Pat. No. 4,599,149, which is a continuation-in-part of Ser. No. 301,390, Sep. 11, 1981, abandoned. This application Sep. 20, 1985, Ser. No. 778,353
The portion of the term of this patent subsequent to Jan. 21, 2003, has been disclaimed.
Int. Cl.[4] C25D 3/32, 3/36, 3/56, 3/60
U.S. Cl. 204—44.4 20 Claims

9. An electrolyte for electroplating tin, lead, or tin-lead alloys which comprises:

a soluble divalent tin compound, a soluble divalent lead compound, or both;

a soluble alkyl or alkylol sulfonic acid in an amount sufficient to provide a solution having a pH less than about 3;

a sufficient amount of a solution soluble alkylene oxide condensate compound having at least about 8 moles of alkylene oxide to provide an electrolyte having a cloud point above about 90° F.; and

a soluble bismuth compound in a sufficient amount to extend the current density range for electroplating or the brightness of the resultant electrodeposits.

19. An electrolyte for electroplating tin, lead, or tin-lead alloys which comprises:

a soluble divalent tin compound, a soluble divalent lead compound, or both;

a soluble alkyl or alkylol sulfonic acid in an amount sufficient to provide a solution having a pH less than about 3;

a sufficient amount of a solution soluble alkylene oxide condensate compound having at least about 8 moles of alkylene oxide to provide an electrolyte having a cloud point above about 90° F.;

an aromatic aldehyde in a sufficient amount to improve the brightness of the deposit produced by electroplating; and

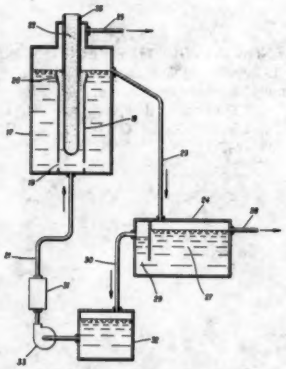
acetaldehyde in a sufficient amount to extend the high current density range for producing bright deposits.

4,617,098

CONTINUOUS ELECTROLYSIS OF LITHIUM CHLORIDE INTO LITHIUM METAL

Jean-Michel Verdier, Paris; Serge Jacubert, Viroflay; Jean Grosbois, L'Isle, and Jean-Yves Dumousseau, Paris, all of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Continuation-in-part of Ser. No. 749,113, Jun. 26, 1985, abandoned, which is a continuation of Ser. No. 527,849, Aug. 30, 1983, abandoned, and a continuation-in-part of Ser. No. 705,016, Feb. 25, 1985, abandoned. This application Oct. 16, 1985, Ser. No. 788,170
Claims priority, application France, Aug. 31, 1982, 82 14865; Feb. 24, 1984, 84 02840
Int. Cl.[4] C25C 3/02, 7/08
U.S. Cl. 204—68 41 Claims



1. A process for the continuous preparation of predetermined amount of lithium metal, comprising (i) in an electrolytic cell, continuously electrolyzing a mixture of molten salts which comprises lithium chloride, which mixture comprises the medium of electrolysis, such medium of electrolysis being in natural circulation within an interspace defined between the electrodes of the cell, said interspace being devoid of physical barrier between said electrodes, and said natural circulation maintaining product lithium metal so formed in admixture with

the mixture of molten salts (ii) continuously withdrawing from said cell an admixture of product lithium metal with the mixture of molten salts, and (iii) continuously discharging undiluted chlorine gas therefrom.

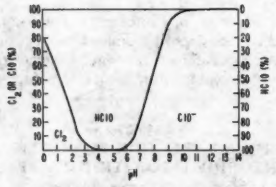
2. The process as defined by claim 1, further comprising the step of (iv) separating the admixture of product lithium metal with the mixture of molten salts as withdrawn from the electrolyte cell in step (ii) into product lithium metal and mixture of molten salts.

4,617,099

ELECTROCHEMICAL BLEACHING OF WOOD PULPS

Gerhart Schwab, Chillicothe; Mei-Tsu Lee, Whitehall, and James W. Bentley, Waverly, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Dec. 23, 1985, Ser. No. 812,142
Int. Cl.[4] C25F 5/00
U.S. Cl. 204—133 18 Claims



1. A process for electrochemically bleaching pulp which comprises:

dispersing a pulp in a solution of sodium chloride to provide a first pulp slurry;

subjecting said pulp slurry to electrolysis at a pH in the range of about 0 to 2.0;

filtering said pulp slurry to remove said pulp;

dispersing said pulp in a second solution of sodium chloride to provide a second pulp slurry;

subjecting said second pulp slurry to electrolysis at a pH greater than 8.0; and

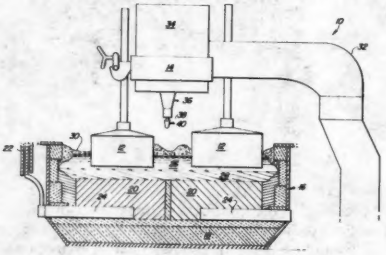
recovering said pulp.

4,617,100

NON-CONDUCTIVE PLUGGER FOOT

Michael J. Boughton, Newburgh, Ind., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 7, 1985, Ser. No. 784,725
Int. Cl.[4] C25C 3/14; C21B 7/12; C21C 5/42
U.S. Cl. 204—245 19 Claims



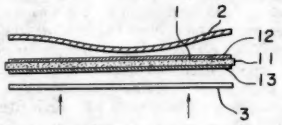
5. A non-conductive plugger foot for breaking through a solidified crust of electrolyte on an electrolytic reduction cell, said plugger foot comprising a hollow shell closed at one end and connected at an opposite end to an air actuated apparatus, said shell containing an alumina based, non-conductive refractory material having an electrical resistance of at least 100,000 ohms.

4,617,101

ALKALI METAL CHLORIDE ELECTROLYZING CELL

Kimihiko Sato; Yasuo Sajima; Makoto Nakao, and Junjiro Iwamoto, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Nov. 12, 1981, Ser. No. 320,436
Claims priority, application Japan, Nov. 15, 1980, 55-160116; Nov. 15, 1980, 55-160117
Int. Cl.[4] C25B 9/00, 11/03, 11/20
U.S. Cl. 204—252 8 Claims



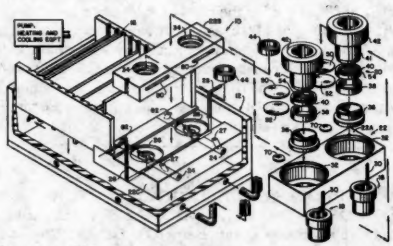
1. An alkali metal chloride-electrolyzing cell which comprises a cation-exchange membrane disposed between an anode and a cathode, characterized in that said cathode-exchange membrane has on at least one side thereof a gas- and liquid-permeable, porous layer which is non-conductive, and at least one of an anode and a cathode is a voided flexible electrode having more rigidity than that of said cation-exchange membrane and in electrical contact with a conductive support member, and said flexible electrode is designed to be forcibly deformed thereby closely contacting said cation-exchange membrane with the surface of each of said electrodes.

4,617,102

PROCESS AND APPARATUS FOR PURIFYING AND CONCENTRATING DNA FROM CRUDE MIXTURES CONTAINING DNA

Graham J. Tomblin, Tappan; Karen B. Wexler, Harrison; John P. Ford, Tappan, and Stuart G. Fischer, New York, all of N.Y., assignors to Lifecodes Corp., Elmsford, N.Y.

Filed Mar. 21, 1985, Ser. No. 714,376
Int. Cl.[4] G01N 27/28
U.S. Cl. 204—299 R 14 Claims



1. Apparatus for purifying and concentrating DNA from a crude mixture containing the DNA comprising:

a container providing a reservoir of electrophoresis buffer solution;

a gel matrix immersed in said electrophoresis buffer solution;

a collection chamber in said container;

means for applying an electric field to said gel matrix;

means for disposing said crude mixture in contact with the gel matrix such that the crude mixture is drawn into the gel matrix, responsive to said electric field;

means for selectively removing, due to their relatively low

molecular weight, all the constituent molecules of the crude mixture, except for the DNA, from said gel matrix responsive to said electric field, including means for sweeping away said constituent molecules by flow of said electrophoresis buffer solution between the bottom of the gel matrix and the collection chamber; and

means for removing from the gel matrix, responsive to said electric field, the DNA still remaining therein such that the DNA is collected in said collection chamber, including means operative when removing the DNA for preventing said flow of said electrophoresis buffer solution, thereby to avoid sweeping away the DNA.

4,617,103

ELECTROPHORETIC SEPARATOR

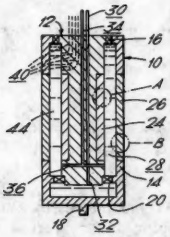
Peter C. Lovegrove, Didcot, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Feb. 20, 1985, Ser. No. 703,475

Claims priority, application United Kingdom, Mar. 2, 1984, 8405601

Int. Cl.⁴ G01N *27/28*

U.S. Cl. 204—300 R **11 Claims**



1. A continuous flow electrophoretic separator comprising a cylindrical stator, a concentric tubular rotor defining an annular chamber between the stator and the rotor, an electrode system incorporated in the stator, an electrode system incorporated into the rotor, means for causing a carrier liquid to flow through the chamber, and an inlet means in the stator for injecting a migrant material into the carrier liquid, wherein one of the electrode systems comprises a tubular semi-permeable membrane supported by a cylindrical support tube of a rigid plastics material, the inner and outer curved surfaces of the support tube defining grooves of sufficient depth to provide fluid communication between the inner surface and the outer surface of the support tube.

4,617,104

CELL UNIT FOR OBSERVING ELECTROPHORESIS

Yoshio Kawai, Musashino; Kiyoshi Kitagawa, Komae; Kazue Endo, Kashiwa, and Chikau Onodera, Urawa, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1983, Ser. No. 563,249

Claims priority, application Japan, Dec. 29, 1982, 57-234554

Int. Cl.⁴ B01D *13/02*

U.S. Cl. 204—301 **9 Claims**

1. A cell unit for observing an electrophoresis comprising:

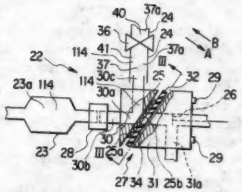
measurement cell for accommodating a liquid specimen therein;

a pair of conduit means for introducing and discharging the liquid specimen into and from the measurement cell therethrough, both of the pair of the conduit means having portions made of flexible tubes;

a pair of valve means, each valve means being adapted to close a respective one of the pair of conduit means, and both of the pair of the valve means associated with both of the conduit means being in the form of pinch valves adapted to be able to pinch the flexible tubes;

a pair of housing means for accommodating a pair of electrodes therein, the pair of electrodes being adapted to produce an electric potential gradient in the liquid specimen within the measurement cell; and

a pair of diaphragm means, each being disposed at a position between the measurement cell and a respective one of the pair of housing means so as to separate a space in the measurement cell from a space in the respective one of the



housing means, both of the pair of diaphragm means being disposed displaceably so as to absorb a fluctuation of a pressure of the liquid specimen in a space defined by the pair of diaphragm means and valve means, each of the diaphragm means being supported liquid-tightly at a peripheral portion thereof, the central portion of each diaphragm means being displaceable in a direction perpendicular to a plane of said each diaphragm means with respect to the peripheral portion of said each diaphragm, and at least one of the diaphragm means being supported linearly movably as a whole.

4,617,105

COAL LIQUEFACTION PROCESS USING PRETREATMENT WITH A BINARY SOLVENT MIXTURE

Robert N. Miller, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sep. 26, 1985, Ser. No. 780,506

Int. Cl.⁴ C10G *1/00, 1/06*

U.S. Cl. 208—412 **17 Claims**

1. In a process for solvent refining of coal at an elevated temperature and pressure in the presence of hydrogen and a hydrogen donor solvent to produce liquid hydrocarbons and normally solid solvent-refined coal, the improvement comprising extracting a coal feed with a binary mixture of an aromatic hydrocarbon of up to 9 carbon atoms and an alkanol of up to 6 carbon atoms at a temperature below about 300° C., before solvent refining the coal.

4,617,106

CATALYSTS FOR COAL LIQUEFACTION PROCESSES

Diwakar Garg, Macungie, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jul. 26, 1985, Ser. No. 780,507

Int. Cl.⁴ C10G *1/06*

U.S. Cl. 208—418 **30 Claims**

1. In a process for catalytic solvent refining of coal at a temperature above 400° C. in the presence of hydrogen and a hydrogen donor solvent, the improvement comprising using as catalyst a combination consisting essentially of:

(a) copper or a compound thereof, and

(b) a Group VI or non-ferrous Group VIII metal, or a compound of either.

4,617,107

PROCESS FOR THE RECOVERY OF OIL FROM SHALE

John Mandelson, Paddington; David J. McCarthy, Glen Waverley; Oto Sitnai, Mount Waverley, and Alan B. Whitehead, East Brighton, all of Australia, assignors to Comonwealth Scientific and Industrial Research Organization and CSR Limited, Australia

PCT No. PCT/AU82/00162, § 371 Date Aug. 24, 1983, § 102(e) Date Aug. 24, 1983, PCT Pub. No. WO83/02283, PCT Pub. Date Jul. 7, 1983

PCT Filed Sep. 30, 1982, Ser. No. 531,891

Claims priority, application Australia, Dec. 24, 1981, PF2083

Int. Cl.[4] C10G *1/00*

U.S. Cl. 208—427 20 Claims

1. A continuous process for the recovery of hydrocarbon values from oil shale with the simultaneous recovery of energy from by-product streams, comprising the steps of:

(a) retorting said shale by intimately mixing particulate oil shale with a process derived hot particulate heat carrier ash containing free lime in the form of calcium oxide or hydrated calcium oxide to produce additional heat, to clean the product gases, and to convert the reacted gases to solid phases;

the temperatures and relative ratios of the shale, the heat carrier ash, and purge gas upon introduction into the retorting zone being selected so that the outlet temperature of the mixture of solids upon retorting is within the range of conventional retorting temperatures;

(b) separating the mixture of spent shale and heat carrier solids from the product gases and vapours containing the desired hydrocarbon values;

(c) producing the heat carrier ash having a calcium oxide content and a temperature required for use in the retorting zone, said heat carrier ash being produced in a combustion zone by:

(i) burning the carbonaceous residues or solids from the retorting zone in admixture with controlled quantities of extraneously added solids and gases containing free lime,

(ii) controlling the average residence times of the phases while also maintaining the combustion temperature within a range which allows for sulphur capture, or

(iii) employing a combination of (i) and (ii);

(d) separating a portion of the coarser hot shale ash from the solids leaving the combustion zone and recirculating this hot stream of solids to the retorting zone as the heat carrier; and

(e) recovering the sensible and chemical heat from the waste solids and the sensible heat from the gases leaving the combustion zone;

wherein the purge gas for retorting contains steam, and in which a substantial part of the heat required for retorting is supplied by reaction of the steam with the lime contained in the heat carrier solids, while maintaining the retorting temperature at a level below 520° C. and the partial pressure of steam in the range of 0.1–1.0 bar.

4,617,108

PROCESS FOR CRACKING WITH SILICA-ALUMINA

Yen-Shin Shyr, and Marvin M. Johnson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 20, 1985, Ser. No. 736,183

Int. Cl.[4] C10G *11/04, 47/12*

U.S. Cl. 208—111 6 Claims

1. A process for cracking a hydrocarbon containing feed stream comprising the step of contacting said feed stream with a silica-alumina catalyst composition under such conditions as to produce hydrocarbon products having lower boiling ranges than said feed stream, wherein said silica-alumina composition is prepared by a method comprising the steps of

(A) mixing a first aqueous solution containing an aluminum salt and an ammonium salt of an acid having a pKa of less than 2 with a second aqueous solution containing an alkali metal silicate, wherein the mol ratio of the alkali metal silicate to the aluminum salt is in the range of from about 2:1 to about 20:1 and the amount of the ammonium salt in said first solution is such that a coprecipitated silica-alumina hydrogel is formed after said mixing;

(B) separating the coprecipitated silica-alumina hydrogel from the mixture of said two solutions;

(C) calcining said hydrogel under such conditions as will result in the formation of an acidic silica-alumina.

4,617,109

COMBUSTION AIR PREHEATING

Thomas A. Wells, Houston, and William C. Petterson, Missouri City, both of Tex., assignors to The M. W. Kellogg Company, Houston, Tex.

Filed Dec. 23, 1985, Ser. No. 812,546

Int. Cl.[4] C10G *9/20;* C07C *4/04*

U.S. Cl. 208—130 6 Claims

1. In a process for steam cracking hydrocarbons to cracked gases in a tubular furnace heated by burning a mixture of fuel and combustion air and subsequently quenching the cracked gases wherein waste heat is recovered in the form of high pressure steam and wherein the combustion air is preheated prior to introduction into the furnace, the improvement which comprises:

(a) superheating the high pressure steam and expanding at least a portion of the superheated high pressure steam through a first turbine to produce shaft work and superheated medium pressure steam at a temperature between 260° and 465° C.;

(b) expanding at least a portion of the superheated medium pressure steam through a second turbine to produce shaft work and low pressure steam at a temperature between 120° and 325° C.; and

(c) preheating the combustion air by indirect heat exchange with at least a portion of the superheated medium pressure steam and at least a portion of the low pressure steam.

4,617,110

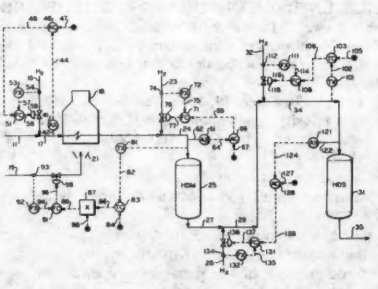
CONTROL OF A HYDROFINING PROCESS FOR HYDROCARBON-CONTAINING FEED STREAMS WHICH PROCESS EMPLOYS A HYDRODEMETALLIZATION REACTOR IN SERIES WITH A HYDRODESULFURIZATION REACTOR

Antonio R. Hinojos, and Bertram T. Bone, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 11, 1984, Ser. No. 619,253

Int. Cl.[4] C10G *45/02*

U.S. Cl. 208—211 29 Claims



1. Apparatus comprising:

a hydrodemetallization reactor;

means for providing a hydrocarbon-containing feed stream

which also contains metals, sulfur and free hydrogen to said hydrodemetallization reactor;

a hydrodesulfurization reactor;

means for withdrawing the reaction effluent from said hydrodemetallization reactor;

means for combining a quench hydrogen stream with the effluent withdrawn from said hydrodemetallization reactor;

means for providing the effluent withdrawn from said hydrodemetallization reactor combined with said quench hydrogen stream as a feed to said hydrodesulfurization reactor;

means for establishing a first signal representative of the actual temperature of the feed provided to said hydrodesulfurization reactor;

means for establishing a second signal representative of the desired temperature of the feed provided to said hydrodesulfurization reactor;

means for comparing said first signal and said second signal and for establishing a third signal which is responsive to the difference between said first signal and said second signal and scaling said third signal so as to be representative of the flow rate of said quench hydrogen required to maintain the actual temperature of the feed provided to said hydrodesulfurization reactor substantially equal to the desired temperature represented by said second signal; and

means for manipulating the flow rate of said quench hydrogen stream in response to said third signal so as to manipulate the rate at which said quench hydrogen stream is combined with the effluent withdrawn from said hydrodemetallization reactor and to maintain the actual temperature for the feed provided to said hydrodesulfurization reactor substantially equal to the desired temperature represented by said second signal.

4,617,111

METHOD FOR THE SEPARATION OF A MIXTURE OF POLYVINYL CHLORIDE AND POLYETHYLENE TEREPHTALATE

Michael J. Grimm, Maumee, and Trannie R. Sehlmeyer, Toledo, both of Ohio, assignors to Plastic Recycling Foundation, Inc., Washington, D.C.

Filed Jul. 26, 1985, Ser. No. 759,217
Int. Cl.[4] B03B 1/00
U.S. Cl. 209—4 **13 Claims**

1. A method for the separation of a mixture of polyvinyl chloride particles and polyethylene terephtalate which comprises the steps of:

(a) applying a solution composed of a solvent of polyvinyl chloride having a density of less than 0.95 grams/cc and water to flakes of polyvinyl chloride and polyethylene terephtalate;

(b) conditioning said flakes of polyvinyl chloride and polyethylene terephtalate in said solution of solvent and water for a predetermined period of time whereby said flakes of polyvinyl chloride absorb the solvent contained in said solution of solvent and water while said flakes of polethylene terephtalate do not absorb said solvent changing the density of said flakes of polyvinyl chloride so that they have less density than do said flakes of polyethylene terephtalate;

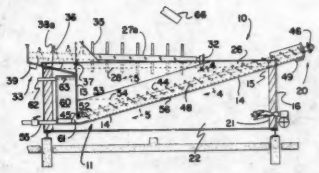
(c) separating said flakes of polyvinyl chloride from said flakes of polyethylene terephtalate.

4,617,112

THERMAL GRAVITY CLASSIFYING APPARATUS AND METHOD

Michael E. Stout; Bobbie Peacock, and Jarl Lindroos, all of Peachtree City, Ga., assignors to M.A. Industries, Inc., Peachtree City, Ga.

Filed Oct. 31, 1984, Ser. No. 666,709
Int. Cl.[4] B03B 5/30, 5/36; C22B 7/00, 7/04
U.S. Cl. 209—11 **13 Claims**



1. The method of selective separation of constituent metals from a scrap mixture containing different kinds of metals, comprising the steps of:

providing a first molten metal in a container;

providing a second molten metal in said container, the specific gravity of said second metal being less than that of the first metal so that the second molten metal forms an upper layer floating on the first molten metal,

said first and second molten metals respectively being first and second metals of the constituent metals being separated from the scrap mixture;

heating the first and second molten metals to a selected temperature above the melting points of said first and second metals, and above the melting point of some but not all of the metals to be separated;

placing the mixture of scrap metals into the upper layer of molten metal, whereby the metal constituents having melting points below said selected temperature are melted and the other metal constituents remain solid;

said melted metal constituents gravitating to join either said upper or lower layer of molten metal, depending on the specific gravity of the melted metal constituents, and thus the first and second constituents become separated from the scrap mixture;

removing the metallic solids floating on the surface of said upper layer, said floating metallic solids having a specific gravity less than the specific gravity of the second metal and thus becoming a third constituent separated from the scrap mixture; and

removing the metallic solids which sink at least to the lower layer of molten metal, said sinking solids having a specific gravity greater than the specific gravity of the second metal and thus becoming a fourth constituent separated from the scrap mixture; and

withdrawing the melted metal constituents from one or more of the first and second molten metal layers from time to time, as the molten metal constituents add to said layers.

4,617,113

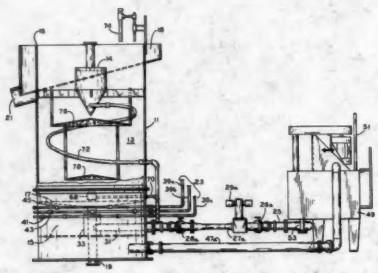
FLOTATION SEPARATING SYSTEM

John A. Christophersen; Fred J. Marquardt, both of Fort Wayne, Ind., and Donald E. Zipperian, Tucson, Ariz., assignors to Deister Concentrator Company, Inc., Fort Wayne, Ind.

Filed Dec. 18, 1984, Ser. No. 683,008
Int. Cl.[4] B03D 1/14
U.S. Cl. 209—170 **3 Claims**

1. In a flotation separating system of the type used to enrich the concentration of certain specified types of particles within a particulate mixture by aerating a treated particle slurry inducing certain particle types to float to the top of a generally cylindrical flotation compartment adhering to small rising air bubbles while other particle types sink to the bottom of the

flotation compartment, an improved arrangement for introducing small air bubbles into the lowermost region of the flotation compartment comprising a bubble passing particle blocking barrier forming the bottom of the compartment, an aerated water distribution manifold of generally cylindrical configuration positioned below the barrier and generally coaxial with the flotation compartment, a water supply line intersecting the manifold generally tangentially, for conveying water to the manifold and including at least one aspirator for entraining air in water flowing in the supply line, water flow within the



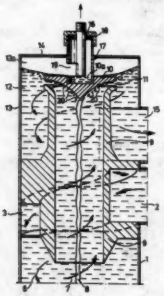
manifold following a generally helical pattern, and a plurality of distribution pipes extending generally tangentially from the manifold to distribute the aerated water in the region below the barrier said distribution pipes including short, medium and long sets of pipes with each set generally equiangularly spaced about the manifold, means for introducing additional water flowing toward the barrier comprising a plurality of inwardly extending water supply pipes, and descending particle diverting means positioned within the flotation compartment generally coaxially therewith for reducing directly downward particle motion centrally in the flotation compartment.

4,617,114

VORTEX CLEANER FOR CLEANING AND DEAERATING PAPER PULP SUSPENSIONS

Karl A. Skardal, Bergstigen 21A, S-182 74 Stocksund, Sweden

Filed Feb. 25, 1985, Ser. No. 704,886
Claims priority, application Sweden, Mar. 7, 1984, 8401275
Int. Cl.[4] B04C *3/00*; B01D *19/00*
U.S. Cl. 209—211 **5 Claims**



1. A vortex cleaner for fractionating a particle-liquid suspension, in particular a paper pulp suspension, comprising:

an elongate, upstanding vortex chamber having a circular cross-section and narrowing downwardly from an upper, relatively wider end provided with an end wall to a lower, relatively narrow end,

a substantially tangential suspension inlet to said vortex chamber at its upper wider end for a suspension to be treated,

an outlet for a relatively heavier fraction at the lower narrower end of said vortex chamber,

outlet means for a relatively lighter fraction including a vortex finder pipe with a diameter smaller than the diameter of said upper wider end of said vortex chamber, said vortex finder pipe extending coaxially through the upper end wall of said vortex chamber and having a lower portion projecting axially into the vortex chamber with its lower open end located lower than said suspension inlet and an upper portion projecting axially upwardly from said end wall with its upper open end located substantially above said end wall,

an additional chamber located axially above the upper end wall of said vortex chamber and having a cylindrical peripheral wall coaxially surrounding the upper portion of said vortex finder pipe and extending axially above the upper end of the vortex finder pipe, a lower end wall coinciding with the upper end wall of the vortex chamber and an upper end wall located substantially above the upper end of the vortex finder pipe, so that said additional chamber encloses a space located above the upper end of the vortex finder pipe,

an outlet opening for said relatively lighter fraction located in the cylindrical peripheral wall of said additional chamber substantially lower than the upper end of the vortex finder pipe,

a disc-shaped flow-deflecting body located axially above, and slightly axially spaced from, the upper end of the vortex finder pipe so as define between itself and the upper end of the vortex finder pipe an annular gap forming a flow passage from said vortex finder pipe into said additional chamber, and

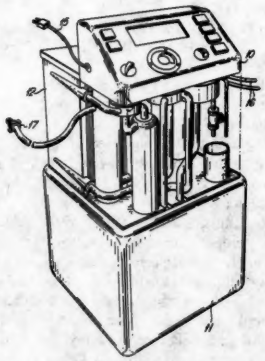
an air venting tube extending into said additional chamber and having its inner open end located in said space enclosed by said additional chamber above said flow-deflecting body.

4,617,115

ARTIFICIAL KIDNEY WITH DISPOSABLE DIALYSIS LIQUID CIRCUIT

Georges Vantard, Gournay-sur-Marne, France, assignor to Hospal Industrie, Meyzieu, France

Continuation of Ser. No. 293,464, Aug. 17, 1981, abandoned. This application Jul. 27, 1983, Ser. No. 517,805
Claims priority, application France, Oct. 6, 1980, 80 21781
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—90 **8 Claims**



1. In an artificial kidney comprising:

(a) a haemodialyser divided up into first and second com-

partments by a membrane making it possible to treat blood by dialysis and by ultrafiltration whereby the blood passes through the first compartment and the dialysis liquid passes through the second compartment,

(b) hydraulic circuit means for causing the treated blood to flow in the first compartment,

(c) hydraulic circuit means for preparing the dialysis liquid, storing it and causing it to flow in the second compartment,

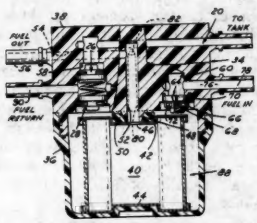
(d) hydraulic circuit means for removing and measuring amounts of liquid equal to the desired amounts of ultrafiltrate, and

(e) means for controlling and checking the means (b) and (c), the controling and checking means being re-usable and grouped together on a console capable of being connected to an electricity supply, the improvement wherein the circulation pump corresponding to said hydraulic circuit means (c) is disposed upstream of the dialyzer and an automatic regulation device maintains at any time within the dialyzer the pressure of the dialysis liquid between the atmospheric pressure and the blood pressure, and furthermore wherein the dialysis liquid hydraulic circuit means (c) and the liquid removing and measuring hydraulic circuit means (d) are designed, manufactured and assembled as a disposable items.

4,617,116
AUTOMOTIVE TYPE FUEL FEED SYSTEM

Wayne H. Seiler, Canton, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 607,029, May 4, 1984, abandoned. This application Mar. 24, 1986, Ser. No. 843,925
Int. Cl.⁴ F02M 47/02
U.S. Cl. 210—137 **2 Claims**



1. A fuel feed system for the fuel pump of an internal combustion engine including a fuel tank,

a fuel reservoir having a fuel inlet line from the tank normally containing fuel at above atmospheric pressure level,

a fuel outlet from the reservoir connected to the inlet suction side of the pump for supplying fuel thereto,

a fuel flow return line normally containing fuel at a pressure level lower than that of the fuel in the reservoir inlet line having one end connected to the outlet side of the pump for evacuating excess fuel from the pump and having first and second branches at its opposite end connected in parallel flow relationship respectively to the reservoir and to the tank, and

a plurality of fuel pressure relief type valve means in the return line branches to automatically control fuel flow therethrough including a first relief valve in the first return line branch connected to the reservoir operable to block communication of the fuel in the return line to the reservoir in response to a higher pressure of the fuel in the reservoir acting thereagainst on one side of the valve than the lower pressure of the return fuel on the other side of the valve, the valve opening upon a reversal of the pressure differential in response to air being present in the reservoir inlet line, and a second relief valve in the second return line branch connected to the tank openable upon a pressure level upstream of the latter valve greater than the pressure level in the tank to pass return line fuel directly to the tank, the second relief valve being closable upon the first relief valve opening in response to a drop in pressure in the reservoir inlet line to an atmospheric level,

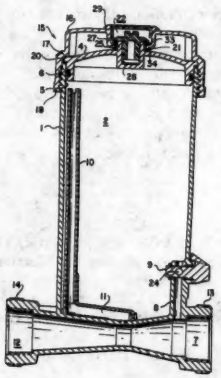
whereby operation of the pump with fuel under pressure in the reservoir inlet line maintains the reservoir supplied with a constant flow of fuel from the latter inlet line for flow through the outlet to the pump and directs the return flow therefrom through the return line directly to the tank bypassing the reservoir,

while operation of the pump when the reservoir inlet line decays to a pressure level lower than the pressure level in the first return line branch causes a diversion of the return flow of fuel in the pump return line to the reservoir and therefrom through the outlet to the inlet of the pump concurrent with the blocking of the flow of return flow to the tank through the second branch thereby providing an uninterrupted supply of fuel at the same volume level to the pump during momentary exposure of the reservoir line to air as when the latter inlet line is at a pressure level higher than the pressure in the first return line branch.

4,617,117
HOUSING ASSEMBLY WITH REMOVABLE JACKED COVER

Robert Messinger, Cranford, and Samuel J. Tobias, Edison, both of N.J., assignors to Hayward Pool Products, Inc., Elizabeth, N.J.

Filed Jul. 20, 1984, Ser. No. 632,759
Int. Cl.⁴ B01D 27/08
U.S. Cl. 210—198.1 **10 Claims**



1. A housing assembly for fluids having a cover removably attached to the housing in a manner that allows jacking of the cover into and away from sealing engagement with the housing, comprising, in combination, a housing; a fluid chamber in the housing; a fluid inlet and a fluid outlet in the housing in fluid flow connection with the fluid chamber; and a removable cover assembly closing off an open end of the fluid chamber and comprising a cover movable into and out from sealing engagement with the housing; a central boss extending outwardly from a central portion of the cover and having an external cylindrical wall defining a bearing surface; a jack ring removably attached to the housing and having a central aperture; the inner periphery of the aperture rotatably embracing the bearing surface of the external wall of the boss; flanged jack ring retaining means attached to the central boss and extending over the jack ring abutting the central aperture thereof and attaching the removable cover axially above and below at each side of the jack ring at the central aperture, attaching the removable cover for axial movement with the

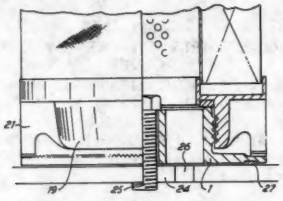
jack ring, in a manner such that the jack ring engages the cover at a central portion adjacent the central aperture of the jack ring, and with axial movement thereof jacks the cover onto the housing into sealing engagement therewith by such engagement when the jack ring is being attached to the housing, and off from the housing out from sealing engagement therewith by engagement with the flanged jack ring retaining means and with a central portion of the jack ring adjacent the central aperture thereof when the jack ring is being removed from the housing, so that the removable cover is jacked onto the housing and off from the housing by the jack ring, for access to the fluid chamber within the housing.

4,617,118

ASSEMBLIES OF CONJOINED PARTS

Michael F. Smart, Glamorgan, Scotland, assignor to Fram Industrial Ltd., Glamorgan, Scotland

Filed Mar. 25, 1985, Ser. No. 715,717
Int. Cl.[4] B01D *29/28*
U.S. Cl. 210—232 **13 Claims**



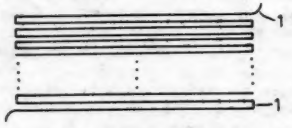
1. An assembly of conjoined parts comprising a mounting part and a mountable part, said parts having complimentary means operable to conjoin them by relative rotation of the parts, wherein one of said parts is provided with at least one resiliently deflectble locating member engageable with a locating track of the other part to resist relative rotation and wherein said mountable part is part of a filter and a coalescer, and said mounting part is a base incorporating fluid flow passages therefrom.

4,617,119

BLOOD EXCHANGE APPARATUS

Bernd Mathieu, Spiesen, Fed. Rep. of Germany, assignor to Eduard Fresenius, Fed. Rep. of Germany

Filed Apr. 21, 1980, Ser. No. 142,417
Claims priority, application Fed. Rep. of Germany, May 5, 1979, 2918140
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—321.3 **7 Claims**



1. A blood exchange device for providing exchange between blood and an exchange liquid said device comprising:

a continuous web of exchange membrane arranged in an accordion fold to present a plurality of aligned membrane portions;

first and second sets of mask-like spacer means coated on at least one side of said web at spaced intervals along the web, said spacer means being located between alternate folds of the web and being aligned in the folds of said web for spacing said membrane portions, said spacer means having peripheral rim portions for sealing said membrane portions while providing central flow chambers along the surfaces of said membrane;

blood supply and discharge means extending through said rim portions of said spacer means;

channel means in said first set of spacer means for connecting said blood supply and discharge means to the flow chambers defined by said first set of spacer means for flowing blood through the device alone one sides of said membrane portions;

exchange liquid supply and discharge means extending through said rim portion of said spacer means; and

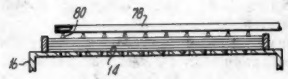
channel means in said second set of spacer means for connecting said exchange liquid supply and discharge means to the flow chambers defined by said second set of spacer means for flowing exchange liquid through the device along the other sides of said membrane portions.

4,617,120

FILTER ELEMENT FOR FILTERING FLUIDS

Ytzhak Barzuza, Petach Tikva, and Boaz Lerner, Herzliya, both of Israel, assignors to Filtration Water Filters for Agriculture and Industry, Ltd., Tel Aviv, Israel

Continuation of Ser. No. 478,310, Mar. 24, 1983, abandoned. This application Oct. 21, 1985, Ser. No. 788,699
Int. Cl.[4] B01D *29/38*
U.S. Cl. 210—409 **15 Claims**



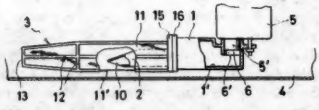
1. A filter element for filtering a fluid, comprising at least one body member having openings providing access and egress for said fluid, and a plurality of fibers associated with said body each having an active length, said fibers being oriented substantially and uniformly in a given direction over at least a portion of their active lengths, along which portion at least, each of said fibers is disposed in close proximity to its adjacent fibers, forming a layer, and means for directing at least one fluid jet onto the active lengths of said fibers in a direction intersecting the plane of said layer, wherein said layer constituted by said plurality of fibers is substantially flat, and said fibers are taut.

4,617,121

IN-TANK PUMP FILTER FOR AUTOMOBILE FUEL TANK

Naoshi Yokoyama, Nagoya, Japan, assignor to Nitco, Inc., Yokohama, Japan

Filed Sep. 4, 1985, Ser. No. 772,310
Claims priority, application Japan, Sep. 10, 1984, 59-136125
Int. Cl.[4] B01D *35/02*
U.S. Cl. 210—416.4 **2 Claims**



1. A filter comprising:

means for enabling use in a fuel tank in combination with a vertically downwardly facing inlet of an in-tank pump of an automobile, including a flat hollow head member including on one end thereof a tubular attachment portion for connection to a vertically downwardly facing inlet of an in-tank pump and at the other end thereof a horizontal opening; a flat auxiliary tubular member including a flange

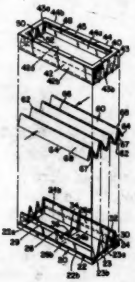
with an engaging portion at one end thereof for engaging said head member around said horizontal opening, said auxiliary tubular member including at its other end a downwardly facing opening which opens below the level of a lower edge of the tubular attachment portion of the hollow head member; and a flat tubular filter member having a mesh surrounding the auxiliary tubular member and including a flange at one end thereof abutting said first mentioned flange, said second mentioned flange including an inset receiving a portion of said first mentioned flange of the auxiliary tubular member.

4,617,122

CRIMP SEAL PLEATED FILTER ASSEMBLY

Barbara L. Kruse, Minneapolis; Darrell D. Gronli, St. Louis Park, and Donald D. Gronholz, Bloomington, all of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed Aug. 1, 1984, Ser. No. 636,578
Int. Cl.[4] B01D *46/52*
U.S. Cl. 210—493.3 7 Claims



1. A crimp seal pleated filter assembly comprising:

(a) a base having a generally four-sided shape, said base including a front and a back and a pair of sides, said front, back and sides having interior and exterior surfaces, said sides including a plurality of projections adjacent to and inset from said interior surfaces of said sides and a pair of side wall blades adjacent to and inset from said interior surfaces of said front and said back, each of said projections extending outwardly and perpendicular to said sides and having an inner-end and a generally pointed outer-end, said side wall blades having an interior surface and an exterior surface and generally pointed outer edges, said side wall blades extending outwardly and perpendicular to said front and said back along the entire length of said interior surfaces of said front and said back;

(b) filter media having two sets of edges and a plurality of pleats, said pleats being laterally aligned with one set of edges and including end pleats having outboard ends flaps at said edges, said other set of edges forming outer ends of said pleats; and

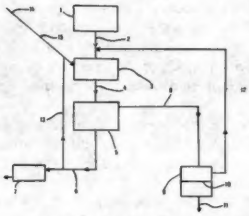
(c) a frame having a generally four-sided shape, and having a front wall and a back wall and a pair of side walls each having interior and exterior surfaces, said side walls having a plurality of projections, extending outwardly along and adjacent to the interior surfaces of said side walls, said projections having inner ends and generally pointed outer ends, said front wall and said back wall having inwardly directed flanges adjacent to and perpendicular to said interior surfaces of said front and back walls, said flanges being contiguous with said inner ends of said projections of said side walls, said side walls interlockingly cooperating with said projections of said base to crimp seal said outer ends of said pleats between said projections of said base and said projections of said side walls, said interior surfaces of said side walls and said base encapsulating said outer ends, said interior surfaces of said front wall and back wall overlapping said side blades to crimp seal said end pleats between said outer edges of said side blades and said flanges, thereby encapsulating said outboard flaps between said exterior surfaces of said side blades and said interior surfaces of said front and back walls.

4,617,123

PROCESSES AND INSTALLATIONS FOR TREATING WASTE WATERS ISSUING FROM THE MANUFACTURE OF SAUERKRAUT

Charles Christ, 65 rue de Paris, 72160 Connerre, France

Filed Apr. 4, 1985, Ser. No. 719,806
Claims priority, application France, Apr. 11, 1984, 84 05741
Int. Cl.[4] C02F *3/02, 3/34*
U.S. Cl. 210—611 2 Claims



1. A method of treating waste waters issuing from the manufacture of sauerkraut comprising the steps of:

introducing the waste water into a fermenter where it is biologically treated, under aerobic conditions with an inoculum of *Candida crusei* and/or *Candida utilis*, at a temperature of between 30° and 49° to form a precipitate and a floating liquid fraction;

separating the formed precipitate from the floating liquid fraction, drying the separated precipitate, and recovering therefrom a foodstuff complement;

treating the floating liquid fraction to reverse osmosis under a pressure higher than the osmotic pressure, using membranes, the cut-off threshold of which is lower than 100 Å, separating the residue which forms about 10% of the liquid fraction and which remains upstream from the membrane, and returning at least a portion of this residue to the biological treatment step.

4,617,124

POLYMERIC MICROFIBROUS FILTER SHEET, PREPARATION AND USE

David B. Pall, Roslyn Estates; Peter J. Degen, Huntington, and Thomas C. Gsell, Levittown, all of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.

Filed Jul. 13, 1982, Ser. No. 397,762
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—638 89 Claims

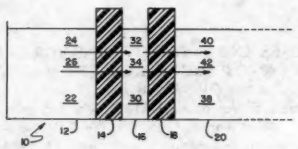
61. A microfibrous, polymeric filter sheet comprised of a normally hydrophobic, microfibrous, polymeric web wherein the surfaces of the polymeric microfibers of said web are coated with a cured, precipitated, cationic, thermoset binder resin or polymer, said filter sheet characterized by being hydrophilic and having a positive zeta potential.

4,617,125

SEPARATIONS BY SUPPORTED LIQUID MEMBRANE CASCADES

Pier R. Danesi, Clarendon Hills, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 1, 1983, Ser. No. 528,510
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—638 17 Claims



11. A method for selectively separating a first chemical species from a second chemical species, both species being contained in first aqueous electrolytic solution and having a common characteristic identified as a Type I or Type II composition with respect to the presence of absence of a positive ionic charge on said species, the method comprising the steps of:

providing a first supported liquid membrane containing a first extractant being capable of extracting the first and second chemical species into the first supported liquid membrane,

contacting the first membrane with the first aqueous electrolytic solution for a time sufficient to extract at least a portion of the first and second chemical species to form first and second extracted species,

providing a second aqueous electrolytic solution capable of stripping at least a portion of the first and second extracted species from the first membrane to form third and fourth chemical species being a Type II composition opposite to Type I composition,

contacting the second electrolytic solution with the first membrane to strip said extracted species and form said third and fourth chemical species of the Type II composition,

providing a second supported liquid membrane containing a second extractant being capable of extracting the third and fouth chemical species into the second supported membrane, one of the extractants being a cation exchanger and the other extractant being an anion exchanger or a neutral extractant, and

contacting the second membrane with the second aqueous electrolytic solution containing the third and fourth chemical species for a time sufficient to form third and fourth extracted species, at least one of the first and second extractants having greater selectivity towards the first or third chemical species to provide separation of the species, the contacting of the first and second species with the first and second membranes being carried out sequentially.

4,617,126

MEMBRANE SEPARATION OF HYDROCARBONS

Edward W. Funk, Highland Park; Sudhir S. Kulkarni, Hoffman Estates, and Y. Alice Chang, Des Plaines, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Aug. 3, 1984, Ser. No. 637,638
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—651 15 Claims

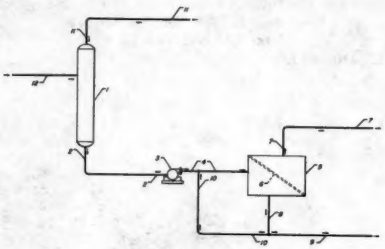
1. A process for the separation of a deasphalted crude oil and a light hydrocarbon solvent from a mixture thereof which comprises passing said mixture over a membrane comprising polysulfone at separation conditions whereby said light hydrocarbon solvent is recovered as the permeate and said deasphalted crude oil is recovered as the retentate.

4,617,127

PRODUCTION OF LOW ALCOHOLIC CONTENT BEVERAGES

William G. Light, San Diego, Calif., assignor to Allied Corporation, Morristown, N.J.

Filed May 20, 1985, Ser. No. 736,047
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—651 14 Claims



1. A continuous feed and bleed process for the diminution of the alcoholic content of an alcoholic beverage which comprises passing a mixture of water and said beverage from a reservoir containing same across a semipermeable membrane, said membrane possessing a chloride ion rejection greater than 97% at 400 psi net pressure and displaying a permeation rate for alcohol that is dependent on net pressure for low net pressure and that is essentially independent of net pressure for high net pressure, at separation conditions including net pressure of from about 50 to about 250 psi to form a permeate comprising alcohol and water, and a retentate comprising said beverage containing a reduced alcoholic content, removing said permeate, recycling a portion of said retentate to admix with added fresh alcoholic beverage and water prior to contact with said semipermeable membrane to form a feed admixture, the portion of said retentate which is recycled comprising from about 80 to about 99% of said retentate, with the portion of the retentate which is not recycled being recovered as a product.

4,617,128

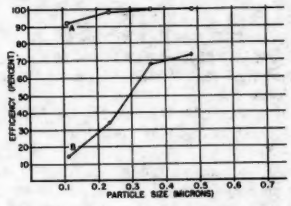
PARTICULATE FILTER AID, FILTER BED AND PROCESS

Eugene A. Ostreicher, Farmington, Conn., assignor to AMF Inc., White Plains, N.Y.

Continuation of Ser. No. 74,376, Sep. 10, 1979, Pat. No. 4,321,288, which is a continuation of Ser. No. 898,578, Dec. 23, 1977, abandoned, which is a continuation of Ser. No. 709,564, Jul. 28, 1976, abandoned, which is a continuation of Ser. No. 598,097, Jul. 22, 1975, Pat. No. 4,007,113, which is a continuation-in-part of Ser. No. 358,822, May 9, 1973, abandoned. This application Feb. 19, 1981, Ser. No. 235,872 The portion of the term of this patent subsequent to Feb. 8, 1994, has been disclaimed.
Int. Cl.[4] B01D *15/04*
U.S. Cl. 210—679 20 Claims

14. A method for the removal of negatively charged submicron particulate contaminates from a fluid comprising passing

the contaminated fluid through a filter bed comprising particulate filter aid coated with a sufficient amount of melamine



formaldehyde cationic colloid to render the anionic surface of the filter aid electro-positive.

4,617,129

SCALE INHIBITION

Michael J. Lees, Urmston, England, assignor to Ciba-Geigy, Ardsley, N.Y.

Filed Jul. 3, 1985, Ser. No. 751,647

Claims priority, application United Kingdom, Jul. 11, 1984, 8417645

Int. Cl.⁴ C02F 5/14

U.S. Cl. 210—700 **3 Claims**

1. A method of inhibiting the precipitation of calcium carbonate from an aqeuous system, comprising adding to the aqueous system an effective precipitation inhibiting amount of bis(phosphonomethylene) aminomethylene carboxylic acid to inhibit said precipitation of said calcium carbonate.

4,617,130

PROCESS AND EQUIPMENT, IN PARTICULAR FOR THE CONDITIONING OF WASTE WATER SLUDGES

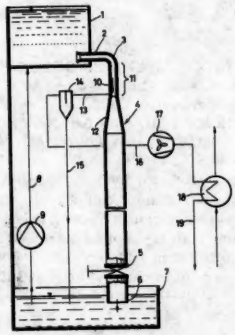
Helmut E. Siekmann, Hermannstrasse 3A, 1000 Berlin 37/Zehlendorf (West), Fed. Rep. of Germany; Jürgen Bässler, Dortmund, and Winfried Liebig, Iserlohn, both of Fed. Rep. of Germany, assignors to Uhde GmbH, Dortmund and Helmut E. Siekmann, Berlin, both of, Fed. Rep. of Germany

Filed Jul. 31, 1985, Ser. No. 761,079

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1984, 3428535

Int. Cl.⁴ B01D 17/06, 35/06

U.S. Cl. 210—748 **12 Claims**



1. Process comprising: treating liquid-solid mixtures for effecting cavitation within the mixture to create impact condensation sufficient to destroy the cell-walls of all biological substances within the mixture by the steps of containing the material mixture in a high-level reservoir, withdrawing the material mixture from the reservoir and passing the mixture through at least one pipe bend having a generally horizontally extending first section extending from the reservoir and a generally vertically extending second section extending downwardly from the first section, providing a generally vertically oriented downwardly extending down pipe from the second section, and effecting a pressure reduction in the material flowing downwardly through the pipe bend into the down pipe for effecting impact condensation.

7. Equipment comprising: means for the treatment of liquid-solid mixture for effecting cavitation within the mixture to create impact condensation sufficient to destroy the cell-walls of all biological substances within the mixture wherein the improvement includes a high-level reservoir containing the material mixture to be treated, a generally horizontally arranged outlet nozzle from said reservoir, at least one pipe bend having a generally horizontally arranged first section connected to said outlet nozzle and a generally vertically arranged second section depending from said first section, a generally vertically arranged drop pipe connected to and extending downwardly from said second section of said pipe bend, a control valve located in said drop pipe adjacent the lower end thereof, and means at the juncture of said second section and said drop pipe for effecting a pressure drop in the material mixture flowing from the reservoir for creating impact condensation.

4,617,131

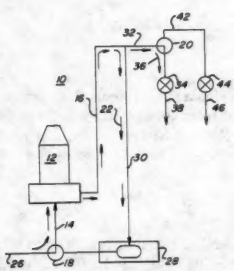
METHOD AND SYSTEM OF CLEANSING A FILTER BED

Kenneth A. Walker, Lutherville, Md., assignor to Environmental Elements Corp., Baltimore, Md.

Filed Jul. 29, 1985, Ser. No. 760,258

Int. Cl.⁴ B01D 41/02

U.S. Cl. 210—794 **21 Claims**



1. A method of cleansing a filter bed having a backwash pump having an inlet line and an outlet line including the steps of:

(a) backwashing said filter bed for initially removing contaminants from said filter bed, said backwash pump drawing liquid from an effluent channel; and,

(b) purging said filter bed subsequent to said backwashing for removal of further contaminants from said filter bed, said step of purging said filter bed including the step of recirculating a first purging portion of liquid pumped by said backwash pump on said backwash pump outlet line through said backwash shoe for return to said backwash pump through said backwash pump inlet line.

4,617,132

METHOD OF ALTERING THE PERMEABILITY OF A HYDROCARBON-CONTAINING SUBTERRANEAN FORMATION

Dwyann Dalrymple, and Edward Vinson, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Apr. 1, 1985, Ser. No. 718,391
Int. Cl.[4] C09K *3/00;* E02D *3/12*
U.S. Cl. 252—8.554 20 Claims

1. A method of reducing the permeability to water of a subterranean formation containing sandstone comprising the steps of:

(a) contacting said formation with an aqueous mixture containing a water-soluble anionic polymer having a molecular weight greater than 100,000 and which is substantially absent any cationic polymer capable of interaction with such anionic polymer; and

(b) contacting said water-soluble anionic polymer with a polymer stabilizing fluid comprising an aqueous solution of a water-soluble cationic polymer having a molecular weight greater than 1,000 which is substantially absent any anionic polymer capable of interaction with such cationic polymer.

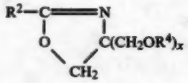
4,617,133

FRICTION REDUCING, ANTIWEAR ADDITIVES

Andrew G. Horodysky, Cherry Hill, and Henry Ashjian, East Brunswick, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 9, 1984, Ser. No. 639,179
Int. Cl.[4] C10M *1/44, 3/38, 5/24, 7/24*
U.S. Cl. 252—32.5 7 Claims

1. A lubricant composition comprising a major amount of an oil of lubricating viscosity of grease prepared therefrom and a minor amount of an additive compound effective for providing multifunctional friction reducing and antiwear properties to said composition consisting essentially of an oxazoline salt of a vicinal diol derived acid phosphate wherein said oxazoline salt is derived from an oxazoline having the following generalized structure



where R^2 is alkyl alkenyl, cycloalkyl, cycloalkenyl, aryl, alkaryl or aralkyl of from about 5 to about 29 carbon atoms and x is from 1 or 2, R^4 is hydrogen or acyl and when x is 2 one R^4 may be hydrogen and one R^4 may be acyl or both may be hydrogen or acyl.

4,617,134

METHOD AND LUBRICANT COMPOSITION FOR PROVIDING IMPROVED FRICTION REDUCTION

Harold Shaub, New Providence, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 205,314, Nov. 10, 1980, abandoned. This application May 10, 1982, Ser. No. 376,934
Int. Cl.[4] C10M *105/08, 105/22*
U.S. Cl. 252—32.7 E 8 Claims

1. In a method of reducing friction in an internal combustion engine comprising lubricating said engine using a lubricating oil composition containing an effective friction reducing amount of an additive which is an ester of a polycarboxylic acid with a glycol or glycerol and from about 0.1 to about 20 parts by weight, based on the weight of lubricating oil composition of an hydroxyl containing ashless dispersant having a high molecular weight aliphatic hydrocarbon oil solubilizing group attached thereto, the improvement comprising said dispersant containing from about 0.35 to about 1.8 millimoles of free hydroxyl groups per gram of dispersant.

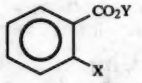
4,617,135

PROCESS FOR THE PREPARATION OF OVERBASED MAGNESIUM SULFONATES

Ronald J. Muir, West Hill, Canada, assignor to Witco Corporation, New York, N.Y.

Filed Jun. 17, 1985, Ser. No. 745,237
Int. Cl.[4] C10M *1/40, 3/34*
U.S. Cl. 252—33.2 18 Claims

1. A process for the preparation of overbased magnesium sulfonates comprising; mixing a sulfonic acid or salt thereof, a magnesium oxide, water, alkanol, and a combination of first and second promoters, wherein the first promoter is one selected from an oil soluble naphthenic acid and an oil soluble carboxylic acid or salt thereof; and a second promoter being one selected from:



(a)

wherein X is one of H, OH, NH_2, CO_2H, $OCOCH_3$ and SH, and Y is one of H, CH_3, CH_2CH_3, wherein the second promoter is less oil soluble than the first promoter; and (b) a water soluble C_1–C_6 carboxylic acid; heating the reactants; and passing an acidic material through the reactants to form the overbased magnesium sulfonate product.

4,617,136

DICOCOAMINE DERIVATIVES OF 2,5-DIMERCAPTO-1,3,4-THIADIAZOLE

Lester A. Doe, Jr., Newtown, Conn., assignor to R. T. Vanderbilt Company, Inc., Norwalk, Conn.

Filed Aug. 16, 1985, Ser. No. 766,382
Int. Cl.[4] C10M *135/36;* C07D *285/12*
U.S. Cl. 252—47 3 Claims

2. A lubricating composition comprising a major part of oil of lubricating viscosity and a corrosion inhibiting amount of 5-dicocoaminomethylthio-2-(octyldithio)-1,3,4-thiadiazole.

3. A lubricating composition comprising a major part of oil of lubricating viscosity and a corrosion inhibiting amount of dicocoamine salt of 2-(octyldithio)-5-mercapto-1,3,4-thiadiazole.

4,617,137

GLYCIDOL MODIFIED SUCCINIMIDES

Frank Plavac, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 21, 1984, Ser. No. 673,962
Int. Cl.[4] C10M *139/00, 133/44*
U.S. Cl. 252—49.6 18 Claims

1. A product produced by the process which comprises contacting at a temperature sufficient to cause reaction an alkenyl or alkyl succinimide containing at least one primary or secondary amine with glycidol wherein the charge mole ratio ranges from greater than 1 and up to 10 of glycidol to each of the basic nitrogens of the alkenyl or alkyl succinimide.

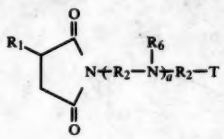
4,617,138

MODIFIED SUCCINIMIDES (II)

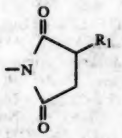
Robert H. Wollenberg, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 12, 1985, Ser. No. 722,882
Int. Cl.[4] C10M *105/50, 105/56*
U.S. Cl. 252—51.5 A 12 Claims

7. A compound of the formula:



wherein R_1 is alkenyl or alkyl of from 10 to 300 carbon atoms; R_2 is alkylene of 2 to 10 carbon atoms; R_6 is hydrogen, lower alkyl of from 1 to 6 carbon atoms, and hydrocarbylcarbonylalkylene wherein said hydrocarbyl contains from 1 to 30 carbon atoms; said alkylene is a three of four carbon alkylene group or a three or four carbon alkylene group substituted with from 1 to 3 alkyl groups of from 1 to 2 carbon atoms each; a is an integer of from 1 to 6; and T is $—N(R_6)_2$, $—NHR_6$ and



wherein R_6 is as defined above and R_1 is alkenyl or alkyl of from 10 to 300 carbon atoms, with the proviso that the compound contains at least one R_6 which is hydrocarbylcarbonylalkylene.

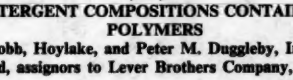
8. A lubricating oil composition comprising an oil of lubricating viscosity and an amount effective to provide dispersancy of a compound as defined in claim 7.

4,617,139
DETERGENT COMPOSITIONS CONTAINING POLYMERS

Ian D. Robb, Hoylake, and Peter M. Duggleby, Irby, both of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Oct. 21, 1985, Ser. No. 789,588
Claims priority, application United Kingdom, Aug. 12, 1984, 8520184; Oct. 23, 1984, 8426737
Int. Cl.[4] C11D *3/37*
U.S. Cl. 252—135 **7 Claims**

1. A detergent composition comprising from 3 to 50% by weight of a detergent-active compound selected from the group consisting of anionic, nonionic and cationic surfactants and mixtures thereof, from 0 to 60% by weight of a detergency builder and from 0.1 to 10% by weight of an anti-redeposition polymer, said polymer being one having the general formula:



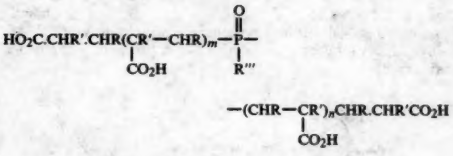
wherein

R is a group selected from hydrogen, a carboxyl radical, an anhydride formed from said carboxyl radical and from the carboxyl radical on the adjacent carbon atom in said formula, and combinations thereof;

R′ is a group selected from hydrogen, methyl or ethyl radical, and combinations thereof;

R″ is a group selected from hydrogen, straight- or branched-chain alkyl radical having from 1 to 18 carbon atoms, cycloalkyl radical having from 5–12 carbon atoms, an aryl radical, an alkaryl radical and a radical of the general formula OX, wherein X may be a hydrogen atom or a straight- or branched-chain alkyl radical having from 1 to 4 carbon atoms;

R‴ is a radical of the general formula OX, wherein X is defined as above; and n is an integer, but when R″ is hydrogen, then the polymer is a mixture of a polymer of the above formula and one of the general formula:



wherein R, R′ and R‴ have their previous significance, and m and n are integers, such as the ratio of the CHR—CR′(CO_2H) unit to the phosphorus atom is from 10:1 to 60:1.

4,617,140
BICYCLOHEXYL DERIVATIVES

Rudolf Eidenschink, and Joachim Krause, both of Dieburg, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 468,736, Feb. 22, 1983, abandoned. This application Jul. 29, 1985, Ser. No. 760,233
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1982, 3206269
Int. Cl.[4] G02F *1/13*; C09K *3/34*; C07C *69/753, 69/757*; C07D *319/06*
U.S. Cl. 252—299.61 **21 Claims**

1. A bicyclohexyl derivative of the formula

$$R^1—Cy—Cy—X—y$$

wherein

X is —CO—O— or O—CO—,

Y is alkyl or perfluoroalkyl each of 1–8 C atoms, or —Ph—Dio—R^2,

Cy is 1,4-cyclohexylene,

Ph is 1,4-phenylene,

Dio is 1,3-dioxane-2,5-diyl and

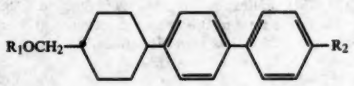
R^1 and R^2 are each independently alkyl or alkoxy each of 1–8 C atoms.

4,617,141
TRANS-4-ALKYLOXYMETHYL-1-(4′-SUBSTITUTED BIPHENYLYL-4)CYCLOHEXANES

Hiromichi Inoue; Takashi Inukai; Yasuyuki Goto; Hideo Sato, and Masahiro Fukui, all of Kanagawaken, Japan, assignors to Chisso Corporation, Osaka, Japan

Division of Ser. No. 502,233, Jun. 8, 1983, Pat. No. 4,522,741. This application Mar. 18, 1985, Ser. No. 712,752
Claims priority, application Japan, Jun. 12, 1982, 57-101172
Int. Cl.[4] C09K *3/34*; G02F *1/13*; C07C *43/168*
U.S. Cl. 252—299.63 **3 Claims**

1. A trans-4-alkyloxymethyl-1-(4′-substituted biphenylyl-4)cyclohexane expressed by the formula



wherein R_1 and R_2 each represent an alkyl group of 1 to 8 carbon atoms.

4,617,142

CYCLOHEXANECARBONYLIC ACID ETHYL ESTER DERIVATIVES

Shigeru Sugimori, Fujisawa, Japan, assignor to Chisso Corporation, Ohsaka, Japan

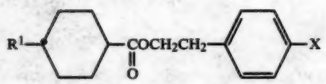
Filed Mar. 28, 1985, Ser. No. 717,040

Claims priority, application Japan, Apr. 10, 1984, 59-71595

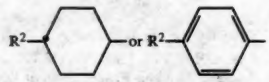
Int. Cl.[4] C09K *3/34;* G02F *1/13;* C07C *69/74, 69/76*

U.S. Cl. 252—299.63 2 Claims

1. A trans-4-substituted-cyclohexanecarboxylic acid β-(4-halogenophenyl) ethyl ester derivative expressed by the general formula



wherein R^1 represents R^2,



wherein R^2 represents an alkyl group or an alkoxy group, each having 1 to 15 carbons and X represents F or Cl.

4,617,143

OXIDIZING POLYMERIZATION WITH ASF_5

Gerhard Kossmehl, Berlin, and Jürgen Hocker, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

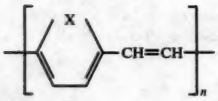
Division of Ser. No. 506,607, Jun. 22, 1983, abandoned. This application Feb. 7, 1985, Ser. No. 699,170

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1982, 3224159; Jun. 29, 1982, 3234160

Int. Cl.[4] H01B *1/00*

U.S. Cl. 252—500 2 Claims

1. Doped products comprising polymers according to the formula:



wherein

X is O or S, and

n is an integer greater than 10,

which have been doped with a protonic acid, a Lewis acid or halogen.

4,617,144

ORGANOLEPTIC USES OF TERTIARY HYDROXYL CARBOXALDEHYDES

Futoshi Fujioka, Wanamassa; Richard M. Boden, Ocean, and William L. Schreiber, Jackson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 656,660, Oct. 1, 1984, Pat. No. 4,576,739, which is a division of Ser. No. 511,965, Jul. 8, 1983, Pat. No. 4,491,537. This application Aug. 23, 1985, Ser. No. 768,807

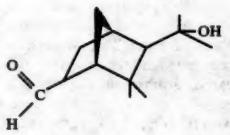
The portion of the term of this patent subsequent to Mar. 18, 2003, has been disclaimed.

Int. Cl.[4] A61K *7/46*

U.S. Cl. 252—522 A 3 Claims

1. A process for augmenting or enhancing the aroma of a perfumed polymer comprising the step of adding to said perfumed polymer, an aroma augmenting or enhancing quantity of a mixture of compounds defined according to the structures:

and



4,617,145

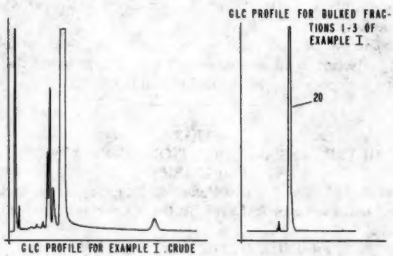
1-METHYL-2(2-METHYLBUTYL) CYCLOHEXANOL DERIVATIVES AND ORGANOLEPTIC USES THEREOF

William L. Schreiber, Jackson; Anubhav P. S. Narula, and Marie R. Hanna, both of Hazlet, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

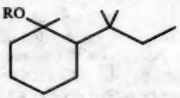
Filed Nov. 21, 1985, Ser. No. 800,429

Int. Cl.[4] A61K *7/46;* C11B *9/00*

U.S. Cl. 252—522 R 14 Claims



1. A 1-methyl-2(2-methylbutyl)cyclohexanol derivative defined according to the structure:



wherein R represents lithium, MgCl, MgBr, hydrogen or acetyl.

4,617,146

SUBSTITUTED BICYCLO[4.3.0]NON-1(6)-EN-8-YL METHYL KETONES AND FRAGRANCE AND FLAVOR COMPOSITIONS

Daniel Helmlinger, Gockhausen; Mario Pesaro, Zurich, both of Switzerland, and Michael Klaus, Weil am Rhein, Fed. Rep. of Germany, assignors to Givaudan Corporation, Clifton, N.J.

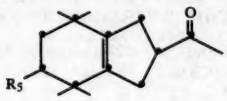
Filed Jan. 9, 1984, Ser. No. 569,019

Claims priority, application Switzerland, Jan. 13, 1983, 189/83

Int. Cl.[4] A61K *7/46;* A23L *2/26;* C07C *49/105*

U.S. Cl. 252—522 R 9 Claims

1. A fragrance composition comprising an olfactorily effective amount of a compound of the formula

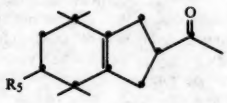


I

wherein:

R_5 represents hydrogen and methyl.

7. A compound of the formula



I

wherein

R_5 represents hydrogen or methyl.

4,617,147

PROCESS FOR PREPARATION OF SOLID PERFUMES

Ichiro Shibanai, 10-6-312, Akasaka 6-chome, Minato-ku, Tokyo 107, Japan

PCT No. PCT/JP85/00078, § 371 Date Oct. 17, 1985, § 102(e) Date Oct. 17, 1985, PCT Pub. No. WO85/03861, PCT Pub. Date Sep. 12, 1985

PCT Filed Feb. 22, 1985, Ser. No. 799,377

Claims priority, application Japan, Mar. 1, 1984, 59-37285

Int. Cl.[4] A61K *7/46*; C11B *9/00*

U.S. Cl. 252—522 A **1 Claim**

1. A process for the preparation of solid perfumes, which comprises mixing a mixture formed by adding a perfume oil to an alcohol solution containing 1 to 5% of hydroxypropylcellulose with a saturated solution of dibenzylidenesorbitol in N-methyl-2-pyrrolidone to form a gel-like solid.

4,617,148

OPAQUE LIQUID HAND SOAP

Susan J. Shields, New Castle County, Del., assignor to Hercules Incorporated, Wilmington, Del.

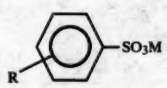
Continuation-in-part of Ser. No. 509,748, Jun. 30, 1983, abandoned. This application Jun. 6, 1984, Ser. No. 617,784

Int. Cl.[4] C11D *1/12, 3/37, 17/08*

U.S. Cl. 252—547 **14 Claims**

1. A liquid soap composition consisting essentially of, in an aqueous medium, by weight of its principal ingredients,

(a) from about 40% to about 90% of an anionic surfactant detergent selected from the group consisting of (i) alkylbenzenesulfonates of the formula:



where R is dodecyl and M is sodium, calcium, triethanolammonium, and isopropylammonium; (ii) alpha-olefinsulfonates of the formula:

$$R'CH{=}CHSO_3Na$$

where R' is 10–18 carbon atoms and mixtures thereof; and (iii) alkyl sulfates of the formula $R''OSO_3M'$ where R'' is lauroyl and M' is sodium, potassium, ammonium, diethanolammonium, and triethanolammonium;

(b) from about 20% to about 50% of a primary lathering agent selected from the group consisting of (i) dialkyl sulfosuccinates of the formula $RO_2CCH_2CH(SO_3Na)CO_2R$, where R is lauroyl or myristyl, (ii) N-acyl-sarcosinates of the formula $R'CON(CH_3)CH_2CO_2Na$, where R'CO— is lauroyl and cocoyl, (iii) sodium N-acyl-N-methyltaurates of the formula $R''CON(CH_3)CH_2CH_2SO_3Na$, where R''CO is acyl, (iv) sodium cocoylisothionate, (v) amidopropylbetaines of the formula $R'''CONHCH_2CH_2CH_2N^+(CH_3)_2CH_2CO_2^-$, where R'''CO is cocoyl and lauroyl, and (vi) mixtures thereof;

(c) from about 5% to about 30% of a nonionic surfactant opacifying agent;

(d) from about 0.5% to about 20% of a primary water-soluble polymer thickener selected from the group consisting of hydroxyethylcellulose and hydroxypropyl guar as its principal ingredients; wherein the total of (a), (b), (c), and (d) is 100% of the principal ingredients; and

(e) water from about 75% to about 85%.

4,617,149

GROWTH HORMONE RELEASE FACTOR ANALOGS

Richard D. DiMarchi, Carmel, and Carl J. Shaar, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 21, 1983, Ser. No. 534,518

Int. Cl.[4] C07K *7/10*

U.S. Cl. 530—324 **6 Claims**

1. A compound having the formula H-Tyr-Ala-Asp-Ala-Ile-Phe-Thr-Asn-Ser-Tyr-Arg-Lys-Val-Leu-Gly-Gln-Leu-Ser-Ala-Arg-Lys-Leu-Leu-Gln-Asp-Ile-X-Ser-Arg-Gln-Gln-Gly-Glu-Ser-Asn-Gln-Glu-Arg-Gly-Ala-Arg-Ala-Arg-Leu-Y in which Y is OH or NH_2 and X is selected from the group consisting of Met(O), Met(S-Me), and Hse and pharmaceutically acceptable salts thereof.

4,617,150

***β*-LACTAMS**

Christian N. Hubschwerlen, Durmenach, France, and Gérard Schmid, Kienberg, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

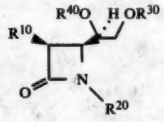
Division of Ser. No. 407,027, Aug. 11, 1982, Pat. No. 4,576,751. This application Aug. 26, 1985, Ser. No. 769,536

Claims priority, application Switzerland, Aug. 27, 1981, 5524/81; Jun. 25, 1982, 3925/82

Int. Cl.[4] C07D *205/08, 403/04, 405/14, 405/04*

U.S. Cl. 540—364 **3 Claims**

1. A compound of the formula



Ie

wherein R^{10} is azido, phthalimido, amino or the group RO-CO—CH=C(CH_3)—NH or Z—NH—, R is lower alkyl, Z is t-butoxycarbonyl, trichloroethoxycarbonyl, benzyloxycarbonyl or benzhydryl, R^{20} is hydrogen or the group Z'-, Z' is 2,4- or 3,4-di-(lower alkoxyl)-benzyl, di-(4-(lower alkoxyl)-phenyl)-methyl or 4-(lower alkoxy)-phenyl and R^{30} and R^{40} each are hydrogen, with the proviso that R^{10} is the group Z—NH— when R^{30} and R^{40} and/or R^{20} is hydrogen,

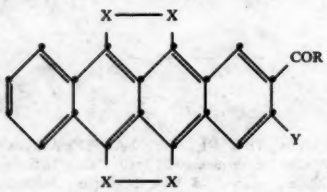
and the corresponding optical antipodes thereof.

4,617,151
2- OR 2,3-SUBSTITUTED 5,6,11,12-TETRATHIOTETRACENE AND 5,6,11,12-TETRASELENOTETRACENE

Carl W. Mayer, Riehen; Vratislav Kvita, Reinach, and Josef Pfeifer, Therwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 15, 1985, Ser. No. 712,291
Claims priority, application Switzerland, Mar. 23, 1984, 1468/84
Int. Cl.[4] C07D *517/02, 517/12*
U.S. Cl. 540—1 3 Claims

1. 2-, or 2,3-substituted 5,6,11,12-tetrathiotetracene or -tetraselenotetracene of the formula I



(I)

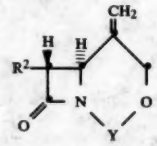
in which X is S or Se and R is alkoxy having 1 to 12 C atoms, cycloalkoxy having 5 to 16 C atoms, ω-hydroxyalkoxy having 2 to 12 C atoms, aryloxy having 6 to 16 C atoms, aralkoxy having 7 to 12 C atoms —OH, —NH_2, —Cl, —Br or —NR^1R^2 in which R^1 is alkyl having 1 to 12 C atoms, cycloalkyl having 5 to 16 C atoms, ω-hydroxyalkyl having 2 to 12 C atoms, aryl having 6 to 16 C atoms or aralkyl having 7 to 16 C atoms and R^2 is a hydrogen atom or independently is defined in the same way as R^1, and Y is a hydrogen atom or a —COR group or Y and R together are —CO—O— or —CO—NR^2.

4,617,152
β-LACTAMS CONTAINING AN α-EXOCYCLIC DOUBLE BOND

Burton G. Christensen, Cliffside Park; Lovji D. Cama, Cresskill, and Susan M. Schmitt, Scotch Plains, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 19, 1985, Ser. No. 703,056
Int. Cl.[4] C07D *498/04;* C07F *7/10*
U.S. Cl. 540—200 6 Claims

1. A compound of the formula:



wherein R^2 is independently selected from hydrogen, linear or branched C_1–C_3 alkyl, which can be substituted with fluoro, hydroxy or protected hydroxy, and Y is a divalent bridging-protecting group, derived from a ketone, aldehyde or organosilicon compound, said group being stable to catalytic hydrogenation and removable by acid or base hydrolysis.

4,617,153
PERFLUOROCARBON POLYMER OXIDATION CATALYST AND PREPARATION OF CARBONYL COMPOUND

Hitosi Nozaki, Takatsuki, and Koichiro Oshima, Kyoto, both of Japan, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 700,655, Feb. 11, 1985. This application Sep. 17, 1985, Ser. No. 765,151
Claims priority, application Japan, Feb. 28, 1984, 59-35321
Int. Cl.[4] C07C *51/285, 45/29*
U.S. Cl. 260—413 1 Claim

1. A method of oxidizing a primary alcohol to form an aldehyde or a carboxylic acid which comprises treating said alcohol with at least one oxidizing agent selected from the class consisting of tertiary butyl hydroperoxide, cumene hydroperoxide, benzoyl peroxide, and sodium bromate in the presence of a perfluorocarbon polymer consisting of a perfluorocarbon main chain and side chains containing terminal structural units of the formula

$$—CF_2SO_2X$$

wherein X is chromium (III) wherein the weight in grams of the perfluorocarbon polymer per one mole of —CF_2SO_2X groups is between 900 and 3000, and wherein the polymer is present in catalytically effective amounts, for a time and temperature sufficient to produce said aldehyde or carboxylic acid.

4,617,154
CHEMICAL PROCESS INVOLVING ETHERS AND AMINES

Michael J. Green, Hedon, England, assignor to BP Chemicals Limited, London, England

Filed Sep. 4, 1984, Ser. No. 647,235
Claims priority, application United Kingdom, Sep. 7, 1983, 8323961
Int. Cl.[4] C07C *121/38, 103/175, 103/178, 69/708*
U.S. Cl. 558—450 11 Claims

1. A process for the production of an ether which comprises reacting an olefin, capable of undergoing the Michael Reaction, and having at least one group selected from the group consisting of —COOR, —COR, —$CONR_2$ or —CN, where R is an alkyl or aryl group, bonded to an olefinically unsaturated carbon atom, with an alcohol in the presence of an effective amount of a catalyst characterised in that the catalyst is:

(a) a cyclic amidine, in which amidine group forms part of a fused ring system, or

(b)

(i) a Lewis base consisting essentially of an organic compound selected from polyamines, trialkylamines, alkylphosphines, polyphosphines, arylamines and aryl phosphines and

(ii) an epoxide.

4,617,155
NOVEL LYSINE SALT CRYSTALS AND PROCESS FOR PRODUCTION THEREOF

Kiyoshi Tanaka, Tokyo; Yoshihiro Koga, Saga; Masaru Saeki, Fujisawa; Tetsuya Kaneko, Kawasaki, and Tetsuya Kawakita, Yokohama, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Feb. 12, 1985, Ser. No. 701,372
Claims priority, application Japan, Feb. 13, 1984, 59-24876
Int. Cl.[4] C07C *53/126, 101/24;* A23J *1/00*
U.S. Cl. 260—501.12 3 Claims

1. An equimolar salt of lysine and 2-hydroxy-4-methylthiobutyric acid.

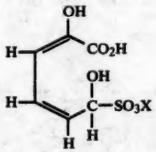
4,617,156

2-HYDROXYMUCONIC SEMIALDEHYDE BISULFITE ADDUCT

Scott Hagedorn, Summit, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Feb. 22, 1984, Ser. No. 582,237
Int. Cl.[4] C07C *143/18*
U.S. Cl. 260—513 R 1 Claim

1. A compound corresponding to the formula:



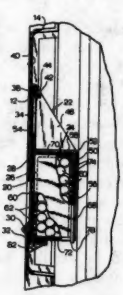
where X is an alkali metal cation.

4,617,157

FRAGRANCE DISPENSER FOR ROOM AIR CONDITIONER

Ray J. Stein, Pigeon Township, County of Vanderburgh, and Raymond G. Simons, Knight Township, County of Vanderburgh, both of Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Apr. 22, 1985, Ser. No. 725,805
Int. Cl.[4] A61L *9/12*
U.S. Cl. 261—96 13 Claims



1. In an appliance having a panel positioned in an air flow path, a fragrance dispenser comprising:

a cartridge mounting base secured to said panel;

a fragrance cartridge attachable to said base at a bottom end and having a front wall and a spaced rear wall connected by side walls forming an interior chargeable with fragrance pellets;

said cartridge having a plurality of dispensing holes through said front wall near said bottom end and a plurality of dispensing holes through said rear wall spaced away from said bottom end;

a reciprocal slide mounted on said panel to slide along an axis between an open position distant from said mounting base and a closed position closer to said mounting base;

said slide having a front wall and a spaced rear wall connected by side walls forming a cavity for receiving said cartridge,

said slide front wall selectively covering said openings in said cartridge front wall and said slide rear wall simultaneously selectively covering said openings in said cartridge rear wall as said slide is axially moved;

said slide rear wall being sufficiently short to provide clearance from said base when said slide is in said open position that exceeds the axial length of said fragrance cartridge so that the fragrance cartridge can be replaced or refilled.

4,617,158

PROCESS FOR TREATING A METAL OXIDE POWDER

Camille Braun, Saint Nizier du Moucherotte; Joël Danroc, Grenoble; Bernard Francois, Montbonnot, and Jean Michel, Biviers, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 12, 1983, Ser. No. 484,419
Int. Cl.[4] G21F *9/16*; B22F *1/00, 3/12*
U.S. Cl. 264—0.5 7 Claims

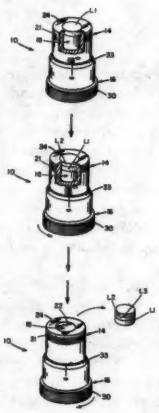
1. A process for the treatment of a metal oxide powder with a view to its fritting, which comprises forming said metal oxide being chosen from the group including uranium dioxide, plutonium dioxide, and the mixed oxides UO_2-PUO_2, UO_2-ThO_2, ThO_2-PuO_2, UO_2-Gd_2O_3, UO_2-PuO_2-Eu_2O_3 and UO_2-PuO_2-Gd_2O_3 a hydrated oxide layer of the same metal on the surface of the particles of said powder prior to compression of said powder into pellets by treating the powder with an oxidizing agent, in the presence of water or water vapor, drying the thus treated powder to eliminate the excess water, bringing the thus treated powder into the form of cylindrical pellets by cold compression; and fritting the thus obtained crude pellets at a temperature of 1400° to 1800° C. under a reducing atmosphere.

4,617,159

METHOD OF MOLDING A DENTAL SHADE SAMPLE

Lloyd L. Miller, 20 Beaver Rd., Weston, Mass. 02193

Filed Jul. 19, 1984, Ser. No. 632,400
Int. Cl.[4] A61C *13/107, 13/09, 19/10*
U.S. Cl. 264—16 3 Claims



1. A method of preparing a dental shade sample comprising a plurality of layers, each of a known thickness, said method comprising:

(1) providing a dental shade sample mold for preparing a plug comprising:

a base,

a cylinder extending upwardly from said base,

a planar platform surface at the upper end of said cylinder, said cylinder being threaded in a region below said platform, and

a hollow annular housing defining an internal cylindrical surface sized and cooperatively threaded to engage said cylinder threads,

whereby the position of the housing relative to said cylinder establishes the depth of the cavity defined by said housing surface and said platform, and rotation of said housing

relative to said cylinder moves the housing vertically with respect to the cylinder and causes said cavity depth to vary continuously by known amounts;

(2) positioning said housing and cylinder in a series of positions by causing relative rotation of said housing and cylinder, said cavity having a different, known depth at each said position;

(3) at each said position, inserting porcelain-forming material into said cavity and condensing said porcelain-forming material to fill the cavity with said material, whereby a porcelain-forming plug is formed comprising a plurality of layers each with a known thickness;

(4) removing said plug from said mold; and

(5) baking said plug.

4,617,160

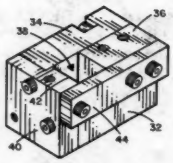
METHOD FOR FABRICATING MODULES COMPRISING UNIFORMLY STACKED, ALIGNED CIRCUIT-CARRYING LAYERS

Robert J. Belanger, Costa Mesa, and Alan G. Bisignano, Anaheim, both of Calif., assignors to Irvine Sensors Corporation, Costa Mesa, Calif.

Filed Nov. 23, 1984, Ser. No. 674,096

Int. Cl.[4] H01L *21/70, 21/90*

U.S. Cl. 264—40.1 **14 Claims**



1. In the manufacturing of an electronic-circuitry-supporting stack of layers, each of which extends in a plane perpendicular to an access plane end at one end of the stack, and each of which provides a multiplicity of spaced electrical leads at the access plane, such leads being part of a two-dimensional planar array having its X-axis parallel to the layer planes and its Y-axis perpendicular to the layer planes, the method comprising:

forming a plurality of substrate layers each having circuitry thereon providing at the access plane end a multiplicity of separate electrical leads spaced along the X-axis of the array;

measuring the thickness of each layer;

determining an order, based at least partially on the layer thickness measurements, in which to stack the layers so as to place the access plane electrical leads at their desired locations in the Y-axis of the array;

fabricating a stack-confining structure which includes (a) lower and upper wall members having surfaces which will engage the lower and upper layers of the stack to determine the Y-axis dimension, and (b) a plurality of position reference elements perpendicular to said wall members adapted to determine the X-axis alignment of at least two sides of each of the layers;

wet stacking the layers in the predetermined order after applying substantially the same amount of a liquid adhesive material between each pair of adjacent layers;

placing the layers in the stack-confining structure supported on the lower wall member;

aligning the layers along the X-axis by engaging them against the position reference elements of the stack-confining structure;

using the upper and lower wall members of the stack-confining structure to exert pressure along the Y-axis causing the Y-axis dimension of the stack to correspond to the desired final dimension; and

subjecting the confined stack to heat in order to cause the liquid adhesive to secure the layers in an integrated stack.

4,617,161

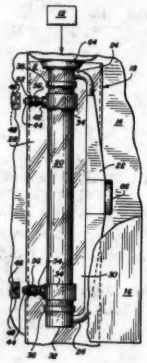
METHOD OF MANUFACTURE FOR A DIALYZER HAVING IMPROVED SIDE PORTS

Richard A. Rollins, Mundelein; Thomas J. Sluga, McHenry, and Henry Tobiasz, Arlington Heights, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Sep. 6, 1983, Ser. No. 529,467

Int. Cl.[4] B22D *11/126*

U.S. Cl. 264—136 **9 Claims**



1. In a method for making a hollow fiber separation device, including the steps of: blow molding an integral structure which comprises at least one tubular housing portion and molding at least one laterally extending, closed-end side port adjacent an end of the tubular housing, the improvement comprising, in combination: the step of forming through the action of laterally advanceable and retractable die member means a seamless outer end portion on said laterally extending port by laterally advancing said die member means against the end of the blow molded side port while said side port is in moldable condition, to form adjacent the end of said side port an annular, outwardly extending seamless shoulder portion, and thereafter laterally retracting said die member means to permit removal of the housing from the blow mold.

4,617,162

FRICTION LININGS, IN PARTICULAR FOR CLUTCH FACINGS, AND METHOD FOR THEIR PRODUCTION

Wolff G. von Rex, and Hans Fetzer, both of Schwäbisch Hall, Fed. Rep. of Germany, assignors to Rex Patent Graf von Rex GmbH & Co KG, Schwäbisch Hall, Fed. Rep. of Germany

Filed Dec. 7, 1981, Ser. No. 328,098

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1980, 3046696

Int. Cl.[4] B29C *47/00;* **C08J** *5/14*

U.S. Cl. 264—176 R **10 Claims**

1. Method for the production of friction linings, using asbestos-free fiber material, heat hardenable binding agents and a plastifying agent, said plastifying agent being selected from the group of substances imparting a flowing or pasty or plasticizing effect, so as to form from said aforementioned components a kneadable spreadable trowelable mass, by extruding the mass containing such components and hardening under heat and pressure, comprising the steps of:

providing a homogenized mixture of fibers, wetting agent, water and a plastifying agent in a fiber: water-mixture ratio from of about 1:3 to 1:7; introducing the heat-hardenable binding agent; extruding the so formed plastic mass so

as to form a formed body; drying the formed body; and strengthening and hardening under heat and pressure.

4,617,163

PRODUCTION OF ION-EXCHANGE MEMBRANE

Peter J. Smith, Cheshire, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Nov. 27, 1984, Ser. No. 675,401

Claims priority, application United Kingdom, Nov. 29, 1983, 8331860

Int. Cl.[4] C08J 5/22; B29C 55/00, 55/12; B29D 7/01

U.S. Cl. 264—235.6 17 Claims

1. A method of increasing the surface area per unit weight of an ion-exchange membrane in which the membrane in the form of a sheet is expanded by dry stretching in order to effect the increase in surface area per unit weight and in which the membrane comprises an organic polymeric material having a plurality of fixed anionic groups associated with cations at least some of which comprise an organic group or a plurality of organic groups.

11. A method as claimed in claim 1 in which expansion is effected by stretching the membrane at elevated temperature.

15. A method as claimed in claim 1 in which the membrane is stretched biaxially.

4,617,164

PROCESS FOR STRETCHING POLYESTER FILMS

Tateo Kanesaki, Nagahama, and Shigeo Utsumi, Yokohama, all of Japan, assignors to Diafoil Company, Limited, Tokyo, Japan

Filed Jan. 16, 1984, Ser. No. 571,069

Claims priority, application Japan, Jan. 18, 1983, 58-6030

Int. Cl.[4] B29C 55/14

U.S. Cl. 264—235.8 19 Claims

1. A process for preparing a substantially flat polyester film which exhibits improved low friction characteristics comprising:

stretching an extruded, substantially unstretched and quenched raw polyester film, first, longitudinally so that an index of birefringence Δn of 0.015–0.055 is attained, stretching it further in the same direction at a temperature between 95° C. and 150° C. inclusive while preventing Δn value from exceeding 0.080, stretching the film transversely to 2.5–5 times its original width and further stretching the film in at least one of the longitudinal or transverse directions by at least 1.1 times.

4,617,165

MOLDED BRAKE PAD

Peter H. S. Tsang, 6624 Corral Ct., Union Lake, Mich. 48085; Joseph P. Coyle, 14415 12 Mile Rd., Warren, Mich. 48037, and Seong K. Rhee, 21222 Summerside La., Northville, Mich. 48167

Filed May 13, 1985, Ser. No. 733,332

Int. Cl.[4] B29C 71/00; C03C 17/00

U.S. Cl. 264—236 16 Claims

1. A method of manufacturing a friction material for use in a brake comprising the steps of:

combining reinforcing fiber, friction modifiers, fillers and phenolic resin in a container to produce a mixture of materials;

adding liquid double salts of dibasic and monobasic phosphoric acid to said container to create a high viscosity in said mixture;

simultaneously adding a metallic oxide and a curing agent to said mixture;

filling molds with a fixed volume of said mixture, said mixture freely flowing into and completely filling said molds;

transporting said molds to a ventilated chamber;

maintaining said ventilated chamber at a temperature substantially equivalent to ambient temperature whereby said metallic oxide initially reacts with said liquid double salts of dibasic and monobasic phosphoric acid and to later allow said curing agent to react with and cure said phenolic resin, said reacted liquid double salts of dibasic and monobasic phosphoric acid and cured phenolic resin forming a two binder matrix which retains reinforcing fiber, friction modifiers, and fillers in a fixed position.

4,617,166

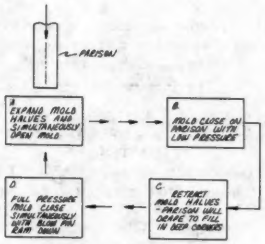
METHOD FOR BLOW MOLDING ARTICLES WITH DEEPLY RECESSED EDGES

Christopher Irwin, Adrian, and Richard M. Bowen, Addison, both of Mich., assignors to Hoover Universal, Inc., Ann Arbor, Mich.

Filed Aug. 26, 1985, Ser. No. 769,540

Int. Cl.[4] B29C 49/04, 49/56

U.S. Cl. 264—531 2 Claims


PARISON
A
EXPAND MOLD HALVES AND SIMULTANEOUSLY OPEN MOLD
B
MOLD CLOSE ON PARISON WITH LOW PRESSURE
C
RETRACT MOLD HALVES - PARISON WALL DRAPE TO FILL IN DEEP CAVITIES
D
FULL PRESSURE MOLD CLOSE SIMULTANEOUSLY WITH BLOW PIN RAM DOWN

1. The method for blow molding a hollow article having at least one recessed edge at the top or bottom ends thereof in a mold that can be opened and closed comprising the steps of:

a. extruding a vertically extending hollow parison,

b. first closing a mold on said parison so as to pinch the lower end closed and grip the upper end of the parison,

c. next moving the top and bottom ends of the mold toward each other so as to compress the parison and shorten the vertical height thereof and thereby position parts of the parison near the portion of the mold defining the at least one recessed edge,

d. then expanding the parison into conformity with the mold cavity including said mold portion defining said at least one recessed edge so as to form said hollow article,

e. then moving said top and bottom mold ends away from each other into clearance relation with the article, and

f. finally opening the molds.

4,617,167

UNDERWATER RADIATION DETECTOR

Lyle W. Kruse, and Richard P. McKnight, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 6, 1984, Ser. No. 586,620

Int. Cl.[4] G21C 17/00

U.S. Cl. 376—153 9 Claims

1. An apparatus for distinguishing between neutron and gamma radiation to detect the presence of spent reactor fuel comprising:

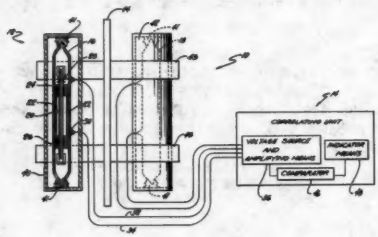
first sensing means for detecting gamma and beta radiation;

first shielding means shielding said first sensing means from a portion of impinging gamma radiation and activating under the influence of neutrons to emit beta radiation, whereby said first sensing means senses both gamma and beta radiation when the apparatus is in the presense of gamma radiation and neutrons;

second sensing means for detecting gamma radiation;

second shielding means, comprising a foil, for shielding said second sensing means from a portion of impinging gamma radiation and not activating under the influence of neu-

trons to emit beta radiation, whereby said second sensing means senses only gamma radiation when the apparatus is in the presence of gamma radiation and neutrons;



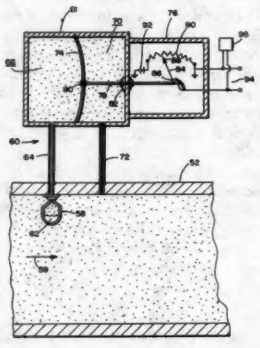
means for correlating the amount of radiation impinging on said first and second sensing means so as to distinguish between neutron and gamma radiation.

4,617,168

APPARATUS AND METHOD FOR REACTOR MONITORING

Ramachandran Muralidharan, and Atambir S. Rao, both of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Apr. 18, 1984, Ser. No. 601,704
Int. Cl.[4] G21C *17/00*
U.S. Cl. 376—247 **9 Claims**



1. Apparatus for monitoring the operation of a boiling water nuclear reactor contained within a vessel externally of the latter, said reactor including a steam line extending from the reactor vessel for continuously tapping said reactor steam; said monitoring apparatus comprising:

a fluid-holding closed system measuring device including, a comparator unit divided by a flexible diaphragm member into a sealed first chamber portion and a second chamber portion, a sensing bulb containing volatile liquid positioned within said steam line exposed to the steam contained therein and in fluid communication through a tube with the sealed first chamber portion of the comparator unit and forming a closed system therewith whereby pressure changes within the sensing bulb due to heat induced volatilization of its liquid contents are transferred through the closed system to the sealed first chamber portion of the comparator unit, said measuring device being adapted to develop an internal vapor pressure corresponding to the temperature of said tapped steam and being calibrated to provide a vapor pressure substantially equal to the tapped steam pressure under normal reactor operating conditions;

means for comparing said internal vapor pressure directly with said tapped steam pressure comprising the second chamber of the comparator unit having a fluid communication through a tube in direct open contact with the interior of the steam line whereby superheated steam conditions in said steam line thermally induce increased vapor pressure in the exposed sensing bulb of the closed system and in turn the sealed first chamber portion of the comparator unit to displace the flexible diaphragm member dividing the comparator into a sealed first chamber and second chamber, said dividing diaphragm member having an arm affixed thereto for transferring its deflecting movement;

and means responsive to said flexible diaphragm member and affixed arm movement of the comparing means for providing a signal corresponding to the differential between the directly compared pressures.

4,617,169

MEASUREMENT OF RADIONUCLIDES IN WASTE PACKAGES

Ronald L. Brodzinski; Richard W. Perkins; Henry G. Rieck, and Ned A. Wogman, all of Richland, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 12, 1984, Ser. No. 649,625
Int. Cl.[4] G21C *17/00*
U.S. Cl. 376—257 **1 Claim**

1. A method for non-destructively assaying the radionuclide content of solid waste in a sealed container comprising:

(a) determining the type of reactor responsible for the generation of said waste;

(b) determining the degree of fuel enrichment of said reactor;

(c) determining the decay time of said waste since exposure in said reactor;

(d) measuring the gamma-ray spectrum of said waste;

(e) determining the matrix density of said waste from ratios of photopeak pairs from individual radioisotopes in said gamma-ray spectrum;

(f) determining the ^{54}Mn, ^{57}Co, ^{58}Co, ^{60}Co, ^{95}Zr, ^{106}Ru, ^{110m}Ag, ^{125}Sb, ^{134}Cs, ^{137}Cs, ^{140}Ba, ^{144}Ce, ^{152}Eu, and ^{154}Eu content in said waste from the intensities of photopeaks in the gamma-ray spectrum characteristic of each isotope and from said matrix density;

(g) determining the ^{90}Sr and ^{90}Y contents of said waste by subtracting the gamma-ray contribution of those isotopes determined in step (f) from said gamma-ray spectrum and attributing the difference to ^{90}Sr and ^{90}Y bremsstrahlung radiation;

(h) determining the ^{129}I and ^{99}Tc contents of said waste from said ^{137}Cs, ^{106}Ru, and ^{144}Ce contents;

(i) determining the ^{3}H, ^{14}C, ^{59}Ni, ^{63}Ni, and ^{94}Nb contents of said waste from said ^{60}Co and ^{54}Mn contents of said waste;

(j) determining burnup from the ratio between said ^{137}Cs content and said ^{134}Cs content and from said reactor type and said fuel enrichment and said decay time;

(k) measuring the total neutron flux and the coincidence neutron flux of said waste;

(l) determining neutron multiplicity from said coincidence neutron flux; and

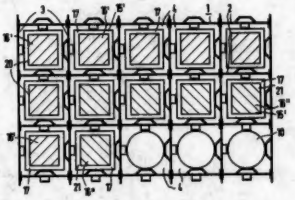
(m) determining the ^{238}Pu, ^{239}Pu, ^{240}Pu, ^{242}Pu, ^{241}Am, ^{243}Am, ^{242}Cm, and ^{244}Cm contents of said waste from said neutron flux, said neutron multiplicity, and said percent burnup.

4,617,170

ASSEMBLY FOR A CORE OF A NUCLEAR REACTOR

Peter Suchy, Erlangen, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Müilheim, Fed. Rep. of Germany

Filed Jan. 16, 1984, Ser. No. 570,830
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1983, 3301965
Int. Cl.[4] G21C *3/34*
U.S. Cl. 376—438 8 Claims



1. Neutron shielding assembly of a reactor core assembled from nuclear reactor fuel assemblies and neutron shielding assemblies, comprising a square grid assembly formed of a multiplicity of spacers distributed over the length of the assemblies and structural elements interconnecting said spacers defining inner and outer rows, and respective rods orderly disposed in said square grid assembly and surrounded by said spacers, said rods of said nuclear reactor fuel assemblies being individual cylindrical fuel rods and said rods of said neutron shielding assemblies being metal rods with square cross sections, and said neutron shielding assemblies disposed at an edge of the reactor core having additional metal rods with square cross sections attenuating neutron radiation emanating from the periphery of the reactor core, the additional metal rods lying at least in one of said outer rows of the neutron shielding assembly.

4,617,171

DEVICE FOR FIXING A GUIDE TUBE IN A RECESS ON THE END FITTING OF A NUCLEAR REACTOR FUEL ASSEMBLY

Claude Feutrel, Vauhallan, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jun. 23, 1983, Ser. No. 507,060
Claims priority, application France, Jul. 1, 1982, 82 11572
Int. Cl.[4] G21C *3/32*
U.S. Cl. 376—446 12 Claims

1. A dismantlable fuel assembly for a nuclear reactor of the water cooled type, said fuel assembly comprising:

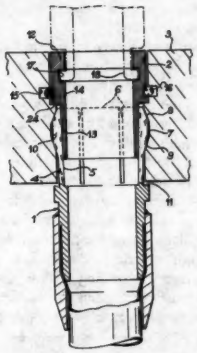
a guide tube;

an end piece having a bore for receiving said guide tube;

said guide tube having a ferrule-like end with an inner cylindrical wall, an outer cylindrical wall, and being slotted to define a plurality of flexible sectors;

said end piece bore and said guide tube end having respective matching internal and external configurations for fixing said bore and guide tube end against any relative axial movement when said configurations are engaged;

a cylindrical locking ring insertable by axial translation into said guide tube end and having a frustoconical external surface radially engaging said sectors for deforming said sectors of said ferrule-like end as said locking ring is inserted to urge said external configuration into engagement with said internal configuration by radial force only; and



means for restraining said locking ring against axial movement, said means for restraining permitting removal of said locking ring by application of axial extraction force.

4,617,172

ALUMINUM ALLOYS OF HIGH WEAR RESISTANCE AND GOOD ANTI-SEIZURE PROPERTY SUITABLE FOR USE AS BEARING METALS

Sanae Mori, Nagoya, Japan, assignor to Daido Metal Company Ltd., Nagoya, Japan

Continuation of Ser. No. 365,653, Apr. 5, 1982, abandoned. This application Oct. 15, 1984, Ser. No. 660,552
Claims priority, application Japan, Jul. 2, 1981, 56-103675
Int. Cl.[4] C22C *21/14*
U.S. Cl. 420—530 3 Claims

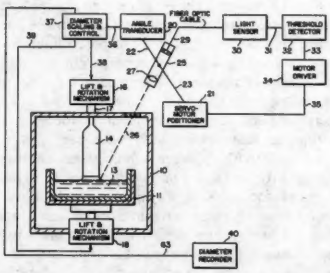
1. Aluminum base bearing alloy for use as bearing metals, consisting by weight of 3–40% Sn, 0.1–10% Pb, 0.1–3% Sb, 0.2–5% Cu, 0.1–3% Si, 0.01–3% V, 0–0.29% of at least one addition metal selected from the group consisting of Mn, Ti, Mg and Ni wherein the total amount of said additional metal and vanadium is from 0.01–3% and the balance Al and incidental impurities.

4,617,173

SYSTEM FOR CONTROLLING THE DIAMETER OF A CRYSTAL IN A CRYSTAL GROWING FURNACE

Henry C. Latka, Rochester, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Nov. 30, 1984, Ser. No. 676,694
Int. Cl.[4] C30B *15/26*
U.S. Cl. 422—107 3 Claims



1. A system for controlling the diameter of a crystal in a

crystal growing furnace having an angle transducer connected to a crystal diameter scaling and control means which is in turn connected to rod and crucible lift and rotation mechanisms, a crucible containing a melt, and crystal diameter scaling and control means comprising;

(a) transducer and servo motor means disposed above a furnace having respective shafts connected along a common axis on opposite sides of a longitunal light tube respectively wherein the light tube and transducer shaft can be angularly positioned by the shaft of the servo motor,

(b) the light tube having a lens for focusing on a spot on a meniscus in the furnace and at times on the melt,

(c) light sense detecting and tracking means for at times generating a servo motor control error signal to drive the servo motor to an angular position corresponding to growth in diameter of the meniscus by angularly tracking a spot of light on the meniscus, and

(d) crystal diameter sensing means governed by a signal from the transducer indicative of the angular position of the light tube when tracking a light spot on the meniscus.

4,617,174

AUTOMATIC AUTONOMOUS APPARATUS FOR THE FAST PRODUCTION OF POLYURETHANE FOAM

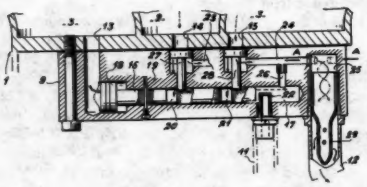
Bernard Bazelaire, Merignac, and Jean-Claude Clebant, Carbon-Blanc, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 20, 1985, Ser. No. 713,793

Claims priority, application France, Mar. 22, 1984, 84 04457

Int. Cl.[4] B01J *14/00*

U.S. Cl. 422—133 **2 Claims**



1. An automatic, autonomous apparatus for the fast production of polyurethane foam comprising means defining a tight storage tank; means dividing said tank into distinctly separate compartments for respectively containing an isocyanate and a polyalcohol; solid propellant gas generation means located in an upper portion of said storage tank; outlet means located at a lower portion of said tank for each of said compartments; pressure threshold mixer means connected to said lower portion of said tank and having manometric trigger means slidably movable in a linear channel in said mixer means, calibrated shearable pin means and a mixing chamber with laterally disposed inlets; said manometric trigger means having a pressure threshold and being actuatable at a predetermined pressure to communicate said compartments via said outlet means with said mixing chamber; said laterally disposed inlets arranged to produce rotational flow in said mixing chamber; means defining and containing a source of neutral gas connected to and communicating with said mixer means to feed gas to one of said laterally disposed inlets upon actuation of said trigger means; rupture means associated with said gas generating means and said dividing means which when ruptured allows gas generated by said gas generating means to exert pressure on said isocyanate and said polyalcohol in said compartments which in turn exert pressure on said manometric trigger means; said manometric trigger means being maintained in a storage position by said calibrated shearable pins and an operating position when said calibrated shearable pins are broken by appearance of the pressure threshold from said isocyanate and polyalcohol.

4,617,175

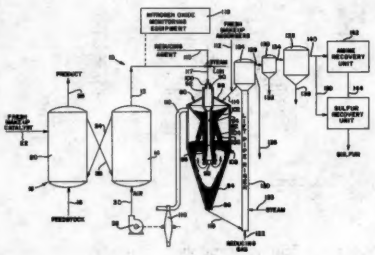
NITROGEN OXIDE, SULFUR OXIDE, AND PARTICULATE REMOVAL SYSTEM

Thomas W. Tolpin, Highland Park, and Richard A. Kretchmer, Clarendon Hills, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 13, 1984, Ser. No. 640,677

Int. Cl.[4] B01D *50/00*

U.S. Cl. 422—171 **26 Claims**



1. A gas purification system, comprising: a substantially vertical vessel having a top portion, a bottom portion, an intermediate portion extending between and connecting said top and bottom portions, an absorber inlet connected to and communicating with said top portion for feeding a substantially nonmagnetic sulfur oxide-capturing and particulate-removing material generally downwardly into said vertical vessel, a bed of nonmagnetic sulfur oxide-capturing and particulate-removing material positioned in said lower portion for simulataneously removing a substantial portion of particulates and sulfur oxides from an influent gaseous stream in the absence of an induced electromagnetic field, an absorbent outlet extending downwardly from said bottom portion, a conduit providing a gas inlet line extending downwardly into said top portion, said conduit having a downwardly facing discharge mouth providing an outlet for feeding an influent gaseous stream containing particulates, nitrogen oxides and sulfur oxides, substantially downwardly into said bed of nonmagnetic sulfur oxide-capturing and particulate-removing material, a reducing agent gas injector providing a reducing gas inlet connected to and communicating with said conduit for feeding a nitrogen oxide-capturing reducing gas into said vertical vessel to substantially remove nitrogen oxides from said influent gaseous stream, a unitary common feed line extending between, connecting, and communicating with said reducing agent gas injector and said conduit and a gas outle connected to and communicating with one of said portions of said vertical vessel for discharging said gases from said vertical vessel;

said bed of substantially nonmagnetic sulfur oxide-capturing and particulate-removing material selected from the group consisting essentially of nonmagnetic adsorbers and nonmagnetic adsorbers with at least one promoter thereon, said nonmagnetic adsorbers substantially commprising an oxide of at least one metal selected from the group consisting of aluminum, bismuth, manganese, yttrium, antimony, rare earth metals, Group 1a metals, and Group 2a metals, and said promoter comprising at least one member selected from the group consisting essentially of rare earth metals, Group 8 metals, chromium, vanadium, antimony, silver, rhenium, and combinations thereof; and

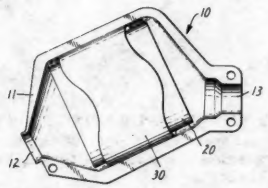
said nitrogen oxide-capturing reducing gas selected from the group consisting of hydrogen, carbon monoxide, ammonia, light hydrocarbon gases, and combinations thereof.

4,617,176

CATALYTIC CONVERTER FOR AUTOMOTIVE EXHAUST SYSTEM

Richard P. Merry, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 13, 1984, Ser. No. 650,167
Int. Cl.[4] F01N 3/28
U.S. Cl. 422—179 6 Claims



1. In a catalytic converter having a metallic casing, a unitary, solid ceramic catalytic element disposed within said casing, and resilient means disposed between said catalytic element and said metallic casing for positioning said catalytic element and for absorbing mechanical and thermal shock, the improvement comprising:

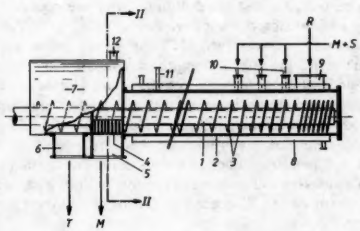
said resilient means being a flexible intumescent planar sheet corrugated with a generally sinusoidal wave pattern along both its lengthwise edges, the corrugations being generally parallel and regular and comprised of substantially equal ridges and hollows having a perimeter to frequency ratio in a range of 2.44 to 4.88 and amplitude in a range of 12 to 50% of the width of said sheet.

4,617,177

SYSTEM FOR CONTINUOUS SOLID/LIQUID EXTRACTION

Heinz O. Schumacher, Höperfeld 26, Hamburg 80, Fed. Rep. of Germany (D-2050)

Filed Oct. 4, 1982, Ser. No. 432,776
Claims priority, application European Pat. Off., Oct. 12, 1981, 81108211.4
The portion of the term of this patent subsequent to Jun. 28, 2000, has been disclaimed.
Int. Cl.[4] B01D 11/02; B65G 33/14; C11B 1/10
U.S. Cl. 422—273 13 Claims



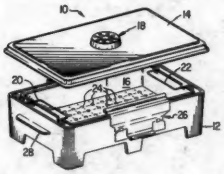
1. An extraction unit for the continuous extraction of raw material with solvent which comprises a substantially horizontally aligned conveyor screw having a first, upstream and a second, downstream end, a vessel containing said screw and having a bottom portion and an upper portion, solids inlet means in said vessel adjacent said first end of the screw to provide a feed point for extraction material, solids discharge means in said vessel adjacent said second end of the screw to provide a discharge point for extraction material, said screw having flights throughout said vessel of varying pitch or spacing wherein the flights have a smallest flight pitch adjacent the feed point and widen in the direction of the discharge point to have a greatest value at the discharge point and wherein a section of the bottom portion of the vessel upstream of the discharge point and adjacent thereto is of screen-like or perforated design to permit passage of liquid phase, liquid outlet means directly connected to said section, and wherein said vessel has at least one solvent inlet connection branch communicating with said screw downstream from the feed point and upstream from the discharge point.

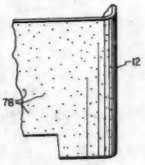
4,617,178

MEDICAL INSTRUMENT STERILIZATION CONTAINER

Robert L. Nichols, 808 Fort Worth, Jacksonville, Tex. 75766

Filed Nov. 5, 1984, Ser. No. 668,090
Int. Cl.[4] A61L 2/00; B65D 51/16
U.S. Cl. 422—310 8 Claims





1. A medical instrument sterilization container comprising:

an apertured housing having generally rigid sides dimensioned for receiving medical instruments for sterilization by gas or steam passing through said aperture;

a removable lid for said housing for enabling access into said housing, for enabling insertion of medical instruments in said housing, and for sealing with said housing to maintain the sterility of the interior of said housing;

said housing formed from a polymer of relatively low thermal conductivity material and mixed with a relatively high thermal conductivity material distributed substantially evenly and throughout the majority of said housing in order that said housing absorbs radiant heat and rapidly conducts the heat throughout the container to reduce the formation of condensate within said container.

8. A medical instrument sterilization container comprising:

an apertured housing having generally rigid sides dimensioned for receiving medical instruments for sterilization by gas or stream passing through said aperture;

a removable lid for said housing for enabling access into said housing, for enabling insertion of medical instruments in said housing, and for sealing with said housing to maintain the sterility of the interior of said housing;

said housing formed from a polymer of relatively low thermal conductivity material and coated at least on the inside surface thereof with a relatively high thermal conductivity material distributed substantially evenly and throughout the majority of said housing in order that said housing

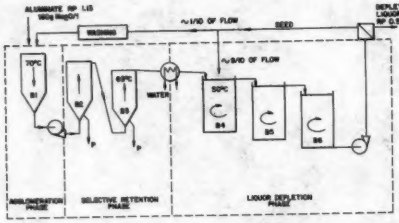
absorbs radiant heat and rapidly conducts the heat throughout the container to reduce the formation of condensate within said container.

4,617,179

PROCESS FOR EFFECTING SEEDING IN TWO PHASES FOR PRODUCING LARGE-GRAIN ALUMINA

Maurice Veyrier, Aix en Provence, France, assignor to Aluminium Pechiney, Paris, France

Filed Nov. 19, 1985, Ser. No. 799,749
Claims priority, application France, Nov. 22, 1984, 84 18135
Int. Cl.[4] C01F 7/02
U.S. Cl. 423—121 11 Claims



1. A two phase seeding process for production of large grain, sandy coarse alumina having less than about 10% by weight of its grains of a size less than about 45 micrometers, by precipitation in a succession of tanks in cascade relationship of a supersaturated solution of sodium aluminate from the alkaline attack on bauxite in accordance with the Bayer process, comprising the steps of:

(a) in a first, agglomeration stage, introducing supersaturated aluminate liquor into a first tank, said liquor having a content equivalent to 110 to 175 grams Na_2O per liter, at a temperature of 65° to 80° C., and seeding said liquor with washed aluminum trihydrate seed in an amount of 20 to 120 grams per liter of aluminate, with downward circulation of said liquor, but in the absence of agitation, to precipitate alumina;

(b) in a second stage, transferring said liquor with precipitated alumina from the bottom of said first tank to at least one second tank, and selectively retaining the largest grains of alumina formed, so as to produce a content in said tank of dry matter of 300 to 800 grams per liter of suspension, then removing from said second tank said largest grains of alumina having a mean size of at least 50 to 60 micrometers, wherein the liquor in the upper part of said second tank rises at a rate of 0.5 to 3 meters per hour, and the mean residence time of said largest grains in said second tank is at least twice the residence time of said aluminate liquor;

(c) in a third, liquor depletion stage, transferring said liquor to at least one further tank, and introducing into said liquor, alumina seeds in an amount of 400 to 800 grams per liter of suspension and 480 to 1200 grams per liter of liquor to further precipitate alumina from said liquor; and

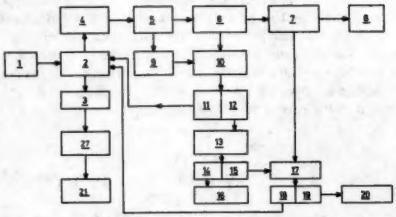
(d) at the end of said third stage, separating said aluminate liquor which is depleted, from alumina having very fine grains, at least 40% by weight of said grains having a size less than about 45 microns, recycling said liquor to the alkaline attack on bauxite in said Bayer process, recycling no more than about 10% by weight of said very fine grains as seeds in said first, agglomeration stage, and recycling the remainder of said very fine grains as seed in said liquor depletion stage.

4,617,180

PROCESS FOR PURIFYING FLUE GAS

Hubert Vogg, Karlsruhe, Fed. Rep. of Germany, assignor to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Jun. 6, 1984, Ser. No. 617,941
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1983, 3320466; Jul. 5, 1983, 3324133
Int. Cl.[4] B01D 53/00
U.S. Cl. 423—240 11 Claims



1. An improved process for purifying flue gas from the combustion of waste materials and recovering slag and heavy metals in a compact and concentrated form, said flue gas comprising solid particulates of various compositions, polluting gases, water vapor and heavy metal vapors, wherein the majority of solid particulates are removed in a dry solids separation system and collected as flue ash, and wherein the remaining solid particulates and the polluting gases are removed by scrubbing, comprising the improvement of:

a. condensing water vapor, HCl and heavy metal vapors from the flue gas after leaving the dry separation system in a condensation/scrubbing system which forms an acid condensate solution having a pH of 4 or less and which scrubs the remaining solid particulates from the flue gas;

b. washing the flue gas previously rendered free of particulates, condensate and heavy metals in the condensing step with an alkali wash solution to remove polluting gases and thereby provide a flue gas purified of combustion waste materials;

c. extracting at least 37.2 percent by weight of soluble heavy metals from the flue ash with the acid condensate solution from the condensing step to produce a purified flue ash;

d. precipitating the soluble heavy metals extracted from the flue ash and the soluble heavy metals contained in the acid condensate solution by reaction thereof with a precipitation agent;

e. separating out the precipitated heavy metals in a solid-liquid separation system, whereby the soluble heavy metals are recovered in a compact and concentrated form; and

f. neutralizing the acid condensate solution after precipitation of heavy metals therefrom by combining it with the alkali wash solution.

4,617,181
SYNTHETIC DIAMOND HEAT SINK

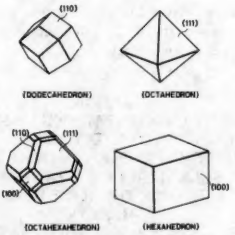
Shuji Yazu, and Shuichi Satoh, both of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 18, 1984, Ser. No. 621,768

Claims priority, application Japan, Jul. 1, 1983, 58-120475; Oct. 18, 1983, 58-195564

Int. Cl.[4] C01B *31/06*

U.S. Cl. 423—446 **5 Claims**



1. A heat sink for an electronic device comprising a synthetic crystal of Type Ib diamond containing 5 to 100 ppm nitrogen and having thermal conductivities higher than 20 W/cm °C. at room temperature.

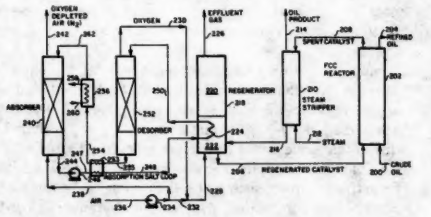
4,617,182
CASCADE HEAT RECOVERY WITH COPRODUCT GAS PRODUCTION

William R. Brown, Zionsville; Anthony A. Cassano, Allentown; Brian R. Dunbobbin, Allentown; Pradip Rao, Allentown, all of Pa., and Donald C. Erickson, Annapolis, Md., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Aug. 26, 1985, Ser. No. 769,230

Int. Cl.[4] C01B *13/04*

U.S. Cl. 423—579 **23 Claims**



1. A method for separating oxygen from air by a reversible chemical absorption and desorption at high temperature and the recovery of heat from a combustion process by integrating the air separation in cascade heat exchange with the combustion process to produce oxygen from air and rejecting heat at a temperature of at least 700° F., comprising the steps of:

(a) compressing air to an elevated temperature and pressure;

(b) contacting at least a portion of the air, which has been preliminarily cleaned and dried, with a liquid chemical absorbent to chemically absorb at least a portion of the oxygen from said air;

(c) heating the oxidized liquid chemical absorbent to a temperature of at least 900° F. by heat exchange of the absorbent with a combustion process which is supplied oxygen at a higher concentration than that of air that produces heat at or above 1000° F. to transfer said heat from the combustion process to the absorbent;

(d) desorbing oxygen from said absorbent utilizing said heat of step (c) to produce an oxygen product and to regenerate the absorbent;

(e) cooling the regenerated absorbent by heat exchange with a process stream to reject heat from the absorbent at a lower temperature level than the heat exchange of step (c) at a temperature level of at least 700° F. and to produce a high temperature process stream;

(f) recycling the absorbent for further contact with air, and

(g) utilizing at least a portion of the oxygen product in the combustion process of step (c).

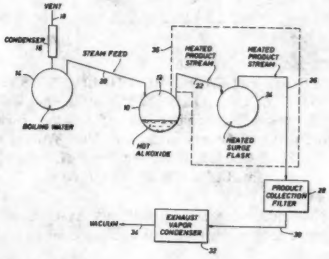
4,617,183
PRODUCTION AND RECOVERY OF ALUMINA FROM VAPOR PHASE HYDROLYSIS OF ALUMINUM TRIALKOXIDES

Duane J. Lewis, Ponca City, Okla., and William H. McNeese, Aberdeen, Miss., assignors to Vista Chemical Company, Houston, Tex.

Filed Aug. 30, 1985, Ser. No. 771,574

Int. Cl.[4] C01F *7/02*

U.S. Cl. 423—630 **8 Claims**



1. An improved process for the production of alumina comprising heating a liquid aluminum trialkoxide to an elevated temperature below the boiling point of said alkoxide, introducing steam into the vapor phase above the surface of said heated alkoxide to effect at least partial hydrolysis of at least some of the alkoxide molecules at the surface of the heated alkoxide, flowing a mixture of steam and said at least partially hydrolyzed alkoxide through a heated reaction zone to effect complete hydrolysis of said alkoxide and form a product stream comprising alumina, excess steam and alcohol maintaining said product stream at a temperature sufficient to prevent condensation of said water and alcohol and recovering alumina produced by said hydrolysis of said alkoxide.

4,617,184
99M TC-1,2-DIHYDROXY-1,2-BIS(DIHYDROXYPHOSPHINYL)ETHANE COMPLEX FOR SKELETON SCANNING

Alexandros K. Tsolis, 171 Old National Road, Arahovitika, Patra, and Spyridon C. Archimandritis, 17 Hydras Street, Amarousion Attikis 15122, Athens, both of Greece

Filed Nov. 29, 1984, Ser. No. 676,189

Int. Cl.[4] C07F *13/00*; A61K *43/00*; A61N *5/12*

U.S. Cl. 424—1.1 **7 Claims**

1. A process for making a ^{99m}Tc-1,2-dihydroxy-1,2-bis(dihydroxyphosphinyl)ethane complex which is bone specific in vivo comprising the steps of:

a. reducing a solution comprising at least 0.5 but less than 10 millicuries per milliliter of 99m- pertechnetate ion until more than 95 mol % of said 99m-pertechnetate ion has been reduced to a 99m-technetium species having an oxidation state greater than zero but less than +7; and

b. reacting said 99m-technetium species with an excess of the complexing agent 1,2-dihydroxy-1,2-bis(dihydroxyphos-

phinyl)ethane, regardless of the stoichiometry of the resulting product, at a pH in the range of 5 to 7.

4,617,185

IMPROVED DEODORANT STICK

Dawn M. DiPietro, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 13, 1984, Ser. No. 630,790
Int. Cl.[4] A61K *17/32*
U.S. Cl. 424—65 11 Claims

1. In an improved deodorant cosmetic gel stick composition comprising

(a) from about 6% to about 70% of an aliphatic polyhydric alcohol having 2 to 3 carbon atoms and from 2 to 3 hydroxyl group;

(b) from 3% to about 10% of a soap and

(c) from about 0.1% to about 1% of a deodorant material wherein the improvement comprises including from about 15% to about 40% of diisopropyl adipate to reduce hair pull, drag, smoothness during application and stickiness after application.

4,617,186

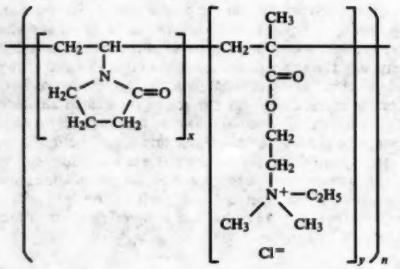
SUSTAINED RELEASE DRUG DELIVERY SYSTEM UTILIZING BIOADHESIVE POLYMERS

Doris Schäfer, and Rolf Schäfer, both of Arisdorf, Switzerland, assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed Dec. 28, 1984, Ser. No. 687,276
Int. Cl.[4] A61K *31/74, 31/78*
U.S. Cl. 424—78 12 Claims

1. A sustained release drug delivery system suitable for ophthalmic use, comprising a cationic polymer of formula:

(I)



wherein: x, y and n are whole numbers such that the cationic polymer has a molecular weight of from about 50,000 to about 2,000,000; and a therapeutically effective amount of an anionic drug residue carried by said polymer.

4,617,187

THERAPEUTIC METHOD FOR TREATING RADIATION ULCERS

Shinichi Okuyama; Hitoshi Mishina, both of Miyagi; Kazumaro Furuse, Tokyo, and Isao Murotani, Kanagawa, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Oct. 29, 1984, Ser. No. 666,099
Claims priority, application Japan, Nov. 8, 1983, 58-208395
Int. Cl.[4] A61K *37/48, 31/12*
U.S. Cl. 424—94 3 Claims

1. In a therapeutic method for treating radiation ulcers, the improvement wherein ubidecarenone is cutaneously applied in an effective amount for treating radiation ulcers.

4,617,188

NATURAL INSECTICIDES EMPLOYING BORAX AND CAROB

Edward J. Page, Bergenfield, N.J., and James E. Rock, Norfolk, Va., assignors to O.U.T. Laboratories, Inc., Norfolk, Va.

Continuation-in-part of Ser. No. 543,905, Oct. 20, 1983, abandoned. This application Apr. 30, 1985, Ser. No. 727,630
Int. Cl.[4] A01N *25/00, 59/14*
U.S. Cl. 424—148 12 Claims

1. An insecticide comprising an effective insecticidally amount of borax, as its active ingredient, and an effective amount of carob selected from the group consisting of superlight and light roast grade carob and mixtures therof, whereby the carob serves as an attractant.

4,617,189

USE OF SELENIUM-CONTAINING COMPOUNDS FOR NEGATING THE TOXIC EFFECTS OF PLATINUM COMPOUNDS USED IN CHEMOTHERAPY, AND A NOVEL SELENIUM-CONTAINING PLATINUM COMPOUND AND USE THEREOF AS AN ANTI-CANCER MEDICINE

Richard F. Stockel, 475 Rolling Hills Rd., Bridgewater, N.J. 08807, and Philip E. Dumas, 137 Louise Dr., Morrisville, Pa. 19067

Division of Ser. No. 484,874, Apr. 14, 1983, Pat. No. 4,556,571, which is a continuation-in-part of Ser. No. 312,300, Jan. 16, 1984, abandoned. This application May 23, 1985, Ser. No. 737,130
Int. Cl.[4] A61K *33/04*
U.S. Cl. 424—162 2 Claims

1. A method of negating the toxic effects of platinum compounds, which comprises administering to a patient having a problem due to undergoing platinum therapy an effective amount of at least one selenium-containing compound selected from the group consisting of sodium selenite, sodium selenate, selenium yeast, an amino acid containing selenium, an amine containing selenium, a seleno carbohydrate and a seleno heterocyclic base,

said amino acid containing selenium being at least one member selected from the group consisting of selenomethionine, selenocysteine, Se-methylselenocysteine, selenohomomethionine, selenohomocystine and selenocystine,

said amine containing selenium being at least one member selected from the group consisting of β-seleno ethylamine, 2-phenylseleno-1,3-diaminopropane, 4-phenylselenomethylene-1,2-diaminobenzene, 2-seleno-1,3-diaminopropane and 4-phenylselenosemicarbazide,

said seleno carbohydrate being at least one member selected from the group consisting of 1-β-D-seleno-2,3,4,6-tetra-O-acetyl-D-glucopyranose, selenoglucopyranose, 1-β-D-seleno-2,3,4,6-tetra-O-acetyl-D-galactopyranose, 1-β-D-selenogalactopyranose, 1-α-D-seleno-2,3,4,6-tetra-O-acetyl-D-mannopyranose and 1-α-D-selenomannopyranose,

said seleno heterocyclic base being at least one member selected from the group consisting of 6-selenoguanine, 6-selenoguanosine, 5-selenocytosine, 5-selenocytidine, 6-selenopurine, 6-selenopurineriboside, 8-selenoguanine, 8-selenoguanosine, 8-selenoadenine and 8-selenoadenosine.

4,617,190

ENZYMATIC POWDER MILK

Robert E. Montgomery, Pacific Palisades, Calif., assignor to Laclede Professional Products, Inc., Gardena, Calif.

Filed Aug. 27, 1984, Ser. No. 644,395
Int. Cl.[4] A23C *9/16*
U.S. Cl. 426—61 21 Claims

1. Aqueous reconstitutible, powder milk that incorporates an enzyme system for generating a bacteriostatic effect upon

aqueous reconstitution, said enzyme system comprising, per gram of power milk:

(a) from about 0.5 to about 500 International Units of oxido-reductase enzyme that is hydro-interactable with and specific to oxidizable substrate in the powder milk for producing hydrogen peroxide, and

(b) from about 0.05 to about 5,000 International Units of peroxidatic peroxidase for interacting with said hydrogen peroxide and oxidizable anion from the powder milk to produce an oxidized anionic bacterial inhibitor in the reconstituted milk.

4,617,191

METHOD AND APPARATUS FOR COATING PARTICULATE MATERIALS WITH POWDERY MATERIALS

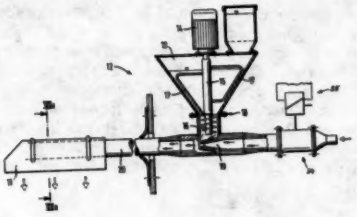
Reinhard Nowak, Binzen, Fed. Rep. of Germany, assignor to Glatt GmbH, Binzen, Fed. Rep. of Germany

Filed May 22, 1985, Ser. No. 736,672

Claims priority, application Fed. Rep. of Germany, May 22, 1984, 3418997

Int. Cl.[4] A23C *9/00*; B29C *67/00*; C05B *19/00*

U.S. Cl. 426—294 **14 Claims**



1. A method for coating particulate materials with powdery materials, said method comprising:

(a) providing a rotary granulator having a substantially horizontal rotary disc and containing particulate solids deposited on the disc, the solids to be coated with a powdery material;

(b) rotating the rotary disc within the granulator to cause the particulate solids to rotate within the granulator and to undergo a spiral movement to form a helical bulge of material at the outer edge of the disc and an adjoining inner surface of the granulator;

(c) providing a nozzle having an inlet connected to a source of compressed air and an outlet that is positioned in a connecting pipe that extends into the granulator, the connecting pipe having an inlet adjacent to the nozzle to permit powdery material to be introduced to the connecting pipe and having an outlet that opens into the granulator;

(d) introducing a powdery substance into the granulator by passing a compressed air stream through the nozzle to draw the powdery material from a storage container that is in communication with the inlet to the connecting pipe to form a mixture of compressed air and the powdery substance; and

(e) spraying the mixture of compressed air and powdery substance onto the surface of the bulge of particulate material as it undergoes spiral movement, to coat the particulate material with the powdery substance.

4,617,192

PROCESS FOR MAKING OPTICAL INP DEVICES

Aland K. Chin, Berkeley Heights; Shobha Singh, Summit; LeGrand G. V. Uitert, Morris Township, Morris County, and George J. Zydzik, Columbia, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 451,789, Dec. 21, 1982, abandoned. This application Feb. 28, 1985, Ser. No. 707,173

Int. Cl.[4] B05D *3/06, 5/06*

U.S. Cl. 427—42 **22 Claims**

1. A process for making an optical device comprising at least one semiconductor substrate with optical surface for the transmission of radiation, said optical surface at least partially coated with a coating consisting essentially of aluminum oxide put down by electron-beam deposition in a vacuum chamber, said vacuum chamber comprising semiconductor substrate with optical surface and source, characterized in that the electron-beam deposition is carried out with a pressure in the vacuum chamber of less than 10^{-3} Torr, the oxygen content of the gas in the vacuum chamber is greater than 30 percent by volume, and the concentration of oxygen near the semiconductor substrate with optical surface is at least a factor of 10 greater than near the electron-beam source and the source comprises single crystal aluminum oxide.

4,617,193

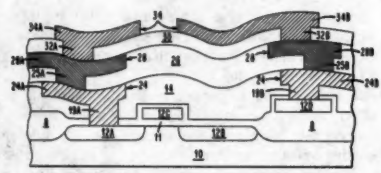
PLANAR INTERCONNECT FOR INTEGRATED CIRCUITS

Andrew L. Wu, Shrewsbury, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 16, 1983, Ser. No. 505,046

Int. Cl.[4] B05D *3/06, 5/12*; B44C *1/22*; G03C *15/00*

U.S. Cl. 427—38 **9 Claims**



1. A method of forming a planar conductor-insulator layer on a surface of an integrated circuit chip comprising the steps of:

(a) forming an insulating layer on the surface of the integrated circuit chip,

(b) forming a recess in the insulating layer,

(c) depositing a layer of conductive material on the insulating layer to a thickness sufficient to fill the recess, thereby leaving a recess in the conductive layer,

(d) forming a mask by:

(1) depositing a layer of masking material on top of the conductive layer such that the thickness of the layer of masking material in the region overlying the recess in the conductive layer is greater than in other regions of the masking layer, and

(2) etching the layer of masking material to expose the top surface of the conductive layer in the regions outside the region overlying the recess in the conductive layer, such that masking material remains in the region overlying the recess in the conductive layer,

(e) etching the exposed surface of the conductive layer to remove the portion of the conductive layer in regions outside the region of the recess in the insulating layer, thereby to leave the recess in the insulating layer filled with conductive material.

4,617,194
RADIATION CURABLE ABRASION RESISTANT COATINGS FOR PLASTICS
Bruce D. Scott, and James W. Watkins, both of Louisville, Ky., assignors to Celanese Corporation, New York, N.Y.
Filed Sep. 3, 1985, Ser. No. 772,084
Int. Cl.[4] B05D 3/06
U.S. Cl. 427—54.1 12 Claims

1. A radiation curable coating composition comprising a blend of (A) an acrylic or methacrylic ester of an aliphatic polyol having at least 3 acryloyloxy or methacryloyloxy groups per molecule, and (B) an acrylic or methacrylic ester of a polyglycidyl ether of a bisphenol A-formaldehyde condensate having at least 4 acryloyloxy or methacryloyloxy groups per molecule, wherein (A) and (B) are in the weight ratio of about 30/70 to about 70/30.

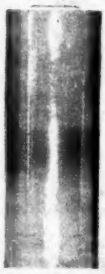
4,617,195
SHIELDED ELECTROLUMINESCENT LAMP
Richard W. Mental, Indianapolis, Ind., assignor to Microlite, Inc., Westfield, Ind.
Continuation-in-part of Ser. No. 593,578, Mar. 26, 1984. This application Aug. 27, 1984, Ser. No. 644,273
Int. Cl.[4] B05D 5/12
U.S. Cl. 427—66 11 Claims

1. The method of forming an electroluminescent device comprising the steps of:
(a) providing a substrate;
(b) depositing a first conductor on the substrate in a preselected pattern to form a first electrode;
(c) covering at least a first portion of the first conductor with a luminescent coating;
(d) depositing a pair of second conductors adjacent to each other, one of the pair of second conductors forming a second electrode and contacting only the luminescent coating and the substrate, the other of the pair of second conductors contacting only the first conductor and the substrate;
(e) depositing an insulative film so as to cover the pair of second conductors; and
(f) depositing a conductive shielding layer over the insulative film, the shielding layer including a terminal portion adapted to be connected to a suitable ground.

4,617,196
METHOD FOR TREATING CATHODE
Donald W. DuBois, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Jun. 10, 1985, Ser. No. 743,186
Int. Cl.[4] B05D 5/12
U.S. Cl. 427—123 19 Claims

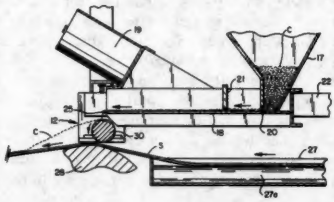
1. In the process of preparing a porous nickel electrode comprising forming a layer of nickel and a sacrificial metal upon a metal substrate, selectively leaching sacrificial metal from the nickel-containing layer, thereby activating the nickel electrode, and treating the electrode to prevent pyrophoricity, the improvement wherein treatment of the electrode comprises maintaining a coating of an aqueous solution consisting essentially of about 4 to 50 weight percent alkali metal hydroxide on the leached nickel electrode while exposing the coated electrode to an oxygen-containing gas for a period of time sufficient to depyrophorize the nickel electrode.

4,617,197
PROCESS FOR IMPROVING THE WETTING CHARACTERISTICS OF THE SURFACE OF SHAPED PLASTICS ARTICLES FOR APPLICATIONS IN CHEMICAL ENGINEERING
Siegbert Rittner, Mörfelden-Walldorf; Eugen Morach, Liederbach; Hubert Schindler, Eppstein, and Peter John, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany
Filed May 24, 1985, Ser. No. 738,087
Claims priority, application Fed. Rep. of Germany, May 28, 1984, 3419856
Int. Cl.[4] B05D 1/12
U.S. Cl. 427—180 5 Claims



1. A process for improving the wetting characteristics of the surface of shaped plastics articles for chemical engineering applications by the application of a metal layer to the surface, which comprises first heating the surface of the shaped plastics article by means of a heating flame to a temperature 10° to 150° C. above the softening point of crystallite melting point of the polymer, and then applying onto the surface a pulverulent, metallic, spraying material having at a particle size of 1 to 600 μm and a temperature of 20° to 700° C. under a pressure of 0.1 to 4.0 bar.

4,617,198
METHOD FOR MAKING ROOFING
John R. Overturf, Lancaster, Ohio, assignor to Transmet Corporation, Columbus, Ohio
Filed Sep. 23, 1985, Ser. No. 778,849
Int. Cl.[4] B05D 1/12, 1/02
U.S. Cl. 427—186 14 Claims



1. A method of producing roofing material which comprises providing a base strip which has an adhesive surface and directing flat metal chips of rectangular shape onto said surface to provide a flat protective layer of the chips on the adhesive surface,
moving the strip continuously beneath a rotating distributing roll and directing the chips continuously into contact with said roll prior to the time said chips are directed onto said surface, the roll being provided with grooves at angularly

spaced positions around said roll to provide sides which engage the chips and fling them onto the adhesive surface of the strip to lay a uniform flat layer of the chips on the surface.

4,617,199

PROCESS FOR THE MANUFACTURING OF ADHESIVE TAPES

Graziano Galli, Formia; Lucio Penzo, Monza, and Felice Pina, Milan, all of Italy, assignors to Manuli Autoadesivi SpA, Cologno, Italy

Continuation of Ser. No. 576,707, Feb. 3, 1984, abandoned. This application Sep. 19, 1985, Ser. No. 777,573
Claims priority, application Italy, Feb. 23, 1983, 19710 A/83
Int. Cl.[4] B05D *1/14*
U.S. Cl. 427—208 5 Claims

1. A process for making printable adhesive tape, said process comprising the steps of:

providing a backing of polypropylene or other olefinic copolymers, said backing having an adhesive side and a back side;

treating said backing to increase its surface tension;

coating said adhesive side with a priming layer and an adhesive layer;

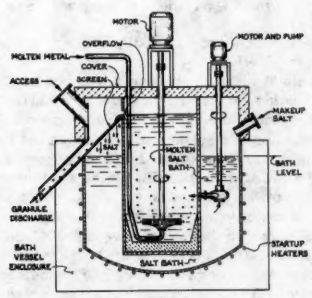
coating said back side with a release lacquer, said release lacquer not requiring primer, and being compatible with printing inks, said release lacquer being selected from the group consisting of chlorinated polyolefins, ethylene-vinyl acetate copolymer, and acrylonitrile-stearyl acetate copolymer.

4,617,200

PROCESS FOR MAKING SALT COATED MAGNESIUM GRANULES

Hugh C. Behrens, Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 6, 1985, Ser. No. 741,783
Int. Cl.[4] C22C *1/04;* B22F *9/08*
U.S. Cl. 427—216 3 Claims



1. A process for the production of substantially uniform granules of magnesium metal coated with a thin layer of a mixed salt composition which comprises:

forming a bath of a molten mixed salt of eutectic nature, which mixture has a freezing point at least 10° below the freezing point of magnesium;

introducing into said bath in a tangential manner a stream of molten magnesium at a rate and velocity to effect a shearing action on the magnesium as it enters the bath forming a globule;

maintaining the bath of a depth and a temperature such that the magnesium will solidify at its surface and rise upwardly through the bath;

withdrawing said bath and its attendant magnesium granules from the bath;

passing the said withdrawn molten salts containing solid magnesium granules over a screen thereby to separate salt coated granules from the molten bath;

returning the molten bath, after cooling, to the first step; and,

recovering said magnesium granules with a thin coat of salt thereon.

4,617,201

METHOD FOR PRODUCING A SYNTHETIC MATERIAL-CONTAINING POWDER

Erich Strommer, Schattendorf, Austria, assignor to Novophalt Societe Anonyme, Luxembourg, Luxembourg

Filed Aug. 9, 1985, Ser. No. 764,232
Int. Cl.[4] C08L *95/00;* C08J *3/12;* C04B *31/40;* E01C *7/26*
U.S. Cl. 427—216 20 Claims

1. A method for producing a powder containing a finely distributed thermoplastic synthetic material which steps comprise introducing polyolefin into a non-aqueous carrier substance selected from the group consisting of bitumen, fats, paraffin and waxes at the melting temperature range of the synthetic material liquid and mixing the polyolefin and carrier to obtain a homogeneous mass; adding to said mass and distributing therein ground lime; and subsequently adding an aqueous slurry selected from the group consisting of red slurry which is a waste product in the production of aluminum, rock flours, flue dust and fuller's earth, to the mass, which is converted by the then-generated reaction between the lime and the aqueous slurry to a powder containing polyolefin.

4,617,202

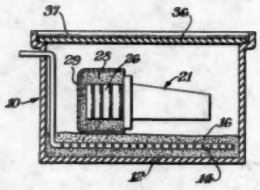
DIFFUSION COATING MIXTURES

Alfonso L. Baldi, Wynnewood, Pa., assignor to Alloy Surfaces Company, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 302,979, Sep. 17, 1981, Pat. No. 4,464,430, and a continuation-in-part of Ser. No. 242,350, Mar. 10, 1981, and a continuation-in-part of Ser. No. 230,333, Feb. 2, 1981, Pat. No. 4,347,267, and a continuation-in-part of Ser. No. 25,456, Mar. 30, 1979, and a continuation-in-part of Ser. No. 71,741, Aug. 30, 1979, abandoned, and a continuation-in-part of Ser. No. 851,504, Nov. 14, 1977, abandoned, and a continuation-in-part of Ser. No. 809,189, Jun. 23, 1977, Pat. No. 4,308,160, said Ser. No. 242,350, and Ser. No. 230,333, each is a continuation-in-part of Ser. No. 89,949, Oct. 31, 1979, abandoned, said Ser. No. 89,949, and Ser. No. 71,741, and Ser. No. 25,456, each is a continuation-in-part of Ser. No. 963,313, Nov. 27, 1978, abandoned, and a continuation-in-part of Ser. No. 752,855, Dec. 21, 1976, Pat. No. 4,208,435, said Ser. No. 851,504, and Ser. No. 809,189, each is a continuation-in-part of Ser. No. 752,855, Dec. 21, 1976, Pat. No. 4,208,435, and a continuation-in-part of Ser. No. 694,951, Jun. 11, 1976, abandoned, and a continuation-in-part of Ser. No. 614,834, Sep. 19, 1975, Pat. No. 4,141,760, which is a continuation-in-part of Ser. No. 466,908, May 3, 1974, Pat. No. 3,958,097, and a continuation-in-part of Ser. No. 404,665, Oct. 9, 1973, Pat. No. 3,948,689, said Ser. No. 404,665, and Ser. No. 357,616, each is a continuation-in-part of Ser. No. 254,403, May 18, 1972, Pat. No. 3,785,854, and a continuation-in-part of Ser. No. 90,682, Nov. 18, 1970, Pat. No. 3,764,371, and a continuation-in-part of Ser. No. 219,514, Jan. 20, 1972, Pat. No. 3,810,357, said Ser. No. 90,682, and Ser. No. 219,514, each is a continuation-in-part of Ser. No. 837,811, Jun. 30, 1969, abandoned. This application Oct. 9, 1981, Ser. No. 310,085
Int. Cl.[4] C23C *11/00*
U.S. Cl. 427—253 6 Claims

1. A composition for masking against diffusion coating, the composition consisting essentially of a used diffusion-chromiz-

ing pack which before that use contained from about 0.6 to about 2% chromium, a nickel content from about ½ to about 3



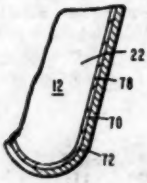
times the chromium content, and an aluminum content about 1/10 to about ½ the chromium content.

4,617,203

PREPARATION OF LIQUID METAL SOURCE STRUCTURES FOR USE IN ION BEAM EVAPORATION OF BORON-CONTAINING ALLOYS

Jerg B. Jergenson, Santa Barbara, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 8, 1985, Ser. No. 721,336
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—294 17 Claims



1. A process for preparing a boronized ion source structure for use in ion beam evaporation of a boron-containing source alloy from an ion beam source, comprising the steps of:

furnishing an ion source structure substrate;

coating the ion source structure substrate with boron to form a substrate-boron couple at the surface of the substrate; and

heating the substrate boron couple in a vacuum or inert atmosphere to a temperature of at least the interface solidus temperature of the substrate-boron couple for less than about one minute thereby forming a liquid layer at the interface of the couple.

4,617,204

CHEMICAL SYNTHESIS OF THIN FILMS AND SUPPORTED CRYSTALS BY OXIDATION OF ZINTL ANIONS

Robert C. Haushalter, Clarendon Hills, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 455,614, Jan. 4, 1983, abandoned. This application Jun. 28, 1985, Ser. No. 750,067
Int. Cl.[4] C23C *18/28, 18/16*
U.S. Cl. 427—304 12 Claims

1. A process for sensitizing a surface of a substrate comprising the steps of

selecting an organic, inorganic or metallic substrate composed predominantly of a supporting matrix reducibly by a polyatomic main group metal anion in a redox reaction by the transfer of electrons to the substrate,

forming a solution of a salt composed of alkali metal cations and polyatomic main group metal anions,

treating said surface with said solution to oxidize the main group metal anions, to reduce the substrate by the transfer of electrons thereto and the formation thereby of a negatively charged matrix, to transfer the alkali metal cations to the substrate, and to deposit the main group metal on the surface of the substrate to form a modified surface of the substrate, and

treating the modified surface with a solution of a salt of a transition metal cation to extract at least a portion of the alkali metal cations from the substrate and deposit the transition metal in elemental form on the modified surface.

4,617,205

FORMALDEHYDE-FREE AUTOCATALYTIC ELECTROLESS COPPER PLATING

Jeffrey Darken, Woking, England, assignor to OMI International Corporation, Warren, Mich.

Filed Dec. 17, 1985, Ser. No. 809,979
Claims priority, application United Kingdom, Dec. 21, 1984, 8432395; Dec. 21, 1984, 8432400
Int. Cl.[4] C23C *3/02*
U.S. Cl. 427—305 20 Claims

1. In a composition for the electroless deposition of copper comprising in aqueous alkaline medium, a source of copper ions, an effective amount of a complexor to keep the copper ions in solution and a reducing agent; the improvement comprising, as said reducing agent, a source of glyoxylate ions, the amounts of complexor and glyoxylate being sufficient to allow copper deposition from the composition, with the proviso that, the complexor is capable of forming a complex with copper which is stronger than a copper-oxalate complex and when the complexor is tartrate, the molar ratio of tartrate to copper is at least 6:1.

4,617,206

METHOD OF MANUFACTURING A LAYER OF AN OXIDE OF AN ELEMENT FROM GROUP IVA

Jan Haisma; Petrus Heller; Johannes M. M. Pasmans, and Udo K. P. Biermann, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 30, 1984, Ser. No. 645,884
Claims priority, application Netherlands, Sep. 2, 1983, 8303059
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—374.1 2 Claims

1. A method of manufacturing a member consisting of a substrate bearing a transparent layer of an oxide of an element from group IVa of the Periodic Table by providing the substrate with a film of a solution of a compound of the element which upon heating is converted into the relevant oxide, drying the film and heating the dried film so as to form the transparent layer of the oxide, wherein the substrate bearing the dried film is heated to a temperature above 700° C. at a rate of at least 30° C./sec in the range between 300° C. and the temperature above 700° C., is kept at the temperature above 700° C. for at least 45 seconds and is cooled to room temperature at a rate of at least 30° C./sec, at least in the range of the temperature above 700° C. and 300° C.

4,617,207

THERMOPLASTIC RESIN SHEET

Toru Ueki; Yoshiaki Fukuda; Katsuyuki Usami, and Kazuharu Kanasaki, all of Yokohama, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Aug. 9, 1984, Ser. No. 639,030
Claims priority, application Japan, Aug. 15, 1983, 58-148140; Mar. 5, 1984, 59-40441; Mar. 13, 1984, 59-46524; Mar. 13, 1984, 59-46525; Mar. 13, 1984, 59-46526; Mar. 13, 1984, 59-46527; Mar. 13, 1984, 59-46528; Apr. 16, 1984, 59-74885; Apr. 16, 1984, 59-74886; Apr. 16, 1984, 59-74887
Int. Cl.[4] C09K *19/00*; B32B *27/36, 27/08*; B29D *23/04*
U.S. Cl. 428—1 15 Claims

1. Thermoplastic resin sheet having a thermal shrinkage

within ±0.3 percent and double refractive index of 8×10^{-5} or smaller, said thermoplastic resin sheet being produced by co-extruding a first thermoplastic resin and a second thermoplastic resin which is nonadhesive to said first thermoplastic resin, said first thermoplastic resin being a rigid polyvinyl chloride resin, polystyrene resin or methylpentene resin and said second thermoplastic resin being a low-density polyethylene resin, high-density polyethylene, polyproplylene resin, polystyrene resin or cellulose-base resin, into a three-layered sheet in which a core layer of said first thermoplastic resin is covered on both surfaces thereof with outer layers of the second thermoplastic resin, the proportion of the thickness of said first thermoplastic resin being controlled to below 90 percent of the total thickness of said co-extruded sheet, and by peeling the outer layers of said second thermoplastic resin off said co-extruded three-layered sheet to obtain a sheet of said first thermoplastic resin.

4,617,208

NON-DIRECTIONAL, SYNTHETIC, OUTDOOR CARPET

Roy A. Cadenhead, Sr., Calhoun, Ga., assignor to Modern Fibers, Inc., Calhoun, Ga.

Filed Jul. 19, 1983, Ser. No. 515,132
Int. Cl.⁴ A01N *3/00*
U.S. Cl. 428—17 **31 Claims**

1. A process of making a non-directional, synthetic outdoor carpet, comprising the steps of

(a) knitting a yarn composed of colored, continuous, polypropylene ribbon into a deknittable fabric, using knitting needles that are set a fixed distance apart,

(b) heating the fabric to a temperature at which the curves and bends generated in the yarn by its knitted configuration are established in the yarn's memory, said temperature being in the range of about 230° to 290° F.,

(c) cooling the fabric to about room temperature,

(d) deknitting the cooled fabric and rewinding the yarn under enough tension to restraighten it,

(e) tufting the yarn as facing yarn into a primary carpet backing material, forming a cut pile carpet having a pile height greater than the between-needles distance used in step (a) above,

(f) coating the underside of the carpet with a heat-settable adhesive that, when cured, will help anchor the tufts of yarn in the backing material, and

(g) heating the adhesive-coated carpet to a temperature at which the adhesive will set and the facing yarn will reconform to the bends and twists in its memory, yielding an outdoor carpet in which the facing yarns are curved and bent in all different directions, giving the carpet a non-directional texture.

4,617,209

MOLDED END CAP FOR EXTRUDED TRIMS

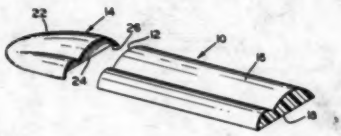
Albert G. Ives, Solon, Ohio, assignor to LOF Plastics Inc., Troy, Mich.

Filed Jan. 8, 1985, Ser. No. 689,792
Int. Cl.⁴ B60R *13/04*
U.S. Cl. 428—31 **3 Claims**

1. A decorative trim strip attachable to an underlying surface of a substrate, comprising:

an elongate extrusion having at least one terminal end and including an upper longitudinally extending shaped surface, said upper shaped surface in cross-section having a flat bottom surface;

an end cap for attachment to the terminal end of said extrusion and constructed to accommodate both an undersized and oversized extrusion, said end cap including a body having a terminal end which is sized and shaped to conform to the size and shape of the terminal end of said extrusion, the terminal end of said end cap having a flexible skirt projecting from the upper edge thereof which extends over and contacts the upper shaped surface of said extrusion;



said flexible skirt being bent inwardly to conform to said undersized extrusion and being adapted to be flexibly deflected outwardly to conform to said oversized extrusion; and

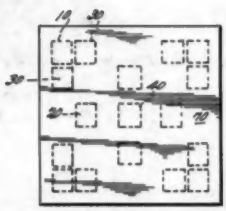
means for securing said end cap and said extrusion to an underlying surface of a substrate wherein the skirt produces a smooth transition between said end cap and said extrusion.

4,617,210

SELF STICKING CARPET TILES

Walter C. Zybko, Lexington, Va., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Mar. 15, 1985, Ser. No. 712,035
Int. Cl.⁴ B32B *7/14*; D04H *1/08*
U.S. Cl. 428—35 **16 Claims**



1. A tile system comprising a plurality of tiles having adhesive on the backs thereof for adhering said tiles to a surface, said adhesive being non-releasably applied to said backs, having release properties as to surfaces other than those covered with adhesive, and being arranged on said backs such that two of said plurality of tiles may be placed in back-to-back contact without having their respective adhesives touch, whereby said two tiles in back-to-back contact may be readily separated from one another.

4,617,211

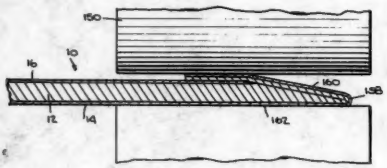
METHOD AND APPARATUS FOR SKIVING AND HEMMING

Carl J. Fries, Jr., Holland, Pa., assignor to International Paper Company, New York, N.Y.

Division of Ser. No. 447,104, Dec. 6, 1982, Pat. No. 4,540,391.
This application Jun. 17, 1985, Ser. No. 745,569
Int. Cl.⁴ B65D *5/40*
U.S. Cl. 428—35 **7 Claims**

1. A blank for a container, said blank comprising: first and second exterior heat sealable layers defining first and second surfaces of said blank and an intermediate layer; and at least one skived and hemmed edge portion having a first skived

region defining a sloped plane and a second skived region substantially parallel to said second surface disposed between said first skived region and the adjacent edge of said blank; said sloped plane and said first surface of said blank defining an angle of less than about 30°; said edge portion having a fold along a line between said first and second skived regions, said



second skived region covering said first skived region, and a portion of said second skived region being heat sealed to said first heat sealable layer, thereby defining a folded-over portion, said folded-over portion having one surface at least a portion of which is substantially flush with said first surface of said blank and another surface which forms an oblique angle with said second surface of said blank.

4,617,212

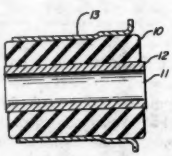
BUSHING

Tiong H. Kuan, Hudson, Ohio, assignor to GenCorp Inc., Akron, Ohio

Filed Mar. 1, 1985, Ser. No. 707,331

Int. Cl.[4] C08K *3/04*; C08L *7/00, 9/00*; F16F *1/38*

U.S. Cl. 428—36 **7 Claims**



1. A low rate resilient bushing exhibiting improved fatigue life and having an annular molded carbon black reinforced conventionally sulfur vulcanized rubber compound insert in compressed relation between a substantially rigid cylindrical inner member and a substantially rigid cylindrical outer member wherein said rubber compound has been vulcanized with an activator system comprising zinc oxide and at least one soluble fatty acid material selected from the group consisting of zinc di(2-ethyl hexanoate), isostearic acid, oleic acid and a zinc-aluminum soap of tall oil fatty acid,

wherein the rubber of said compound is selected from the group consisting of natural rubber and high cis-polyisoprene rubber and mixtures of the same and

wherein said soluble fatty acid material is used in an amount of from 1.4 to 3.0 parts by weight per 100 parts by weight of said rubber (phr).

4,617,213

HYDRAULIC BRAKE HOSE

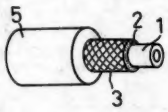
Tetsuji Asano, Inazawa; Keiichi Kodama, Nagoya, and Terumitsu Shigeki, Nishikasugai, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Apr. 9, 1985, Ser. No. 721,393

Claims priority, application Japan, Apr. 14, 1984, 59-75644; Jun. 30, 1984, 59-136393

Int. Cl.[4] F16L *9/00, 11/00*

U.S. Cl. 428—36 **1 Claim**



1. A hydraulic brake hose comprising:

an inner tube made of polyamid synthetic resin;

an adhesive layer formed on the outer surface of said inner tube;

a reinforcing fiber layer made of fiber of high polymeric material and formed on the outer surface of said adhesive layer;

an outer tube made of rubber and formed on the outer surface of said reinforcing fiber layer; said inner tube having the modulus of elasticity of 7,000 to 15,000 kg/cm^2 and having an inner diameter of not less than 2.0 mm, an outer diameter of not more than 6.0 mm and a thickness of not less than 0.7 mm,

wherein the polyamid resin for making said inner tube is nylon, the high polymeric material for making said reinforcing fiber layer is selected from the group consisting of rayon, polyester, polyamid and polyvinyl alcohol, and the rubber for making said outer tube is chloroprene-rubber, and

wherein said adhesive layer is composed of an isocyanate adhesive layer formed on the outer surface of said inner tube and a chloroprene-rubber adhesive layer formed on the outer surface of said isocyanate adhesive layer, and the fiber for forming said reinforcing fiber layer is impregnated with resorcinol formaldehyde latex containing chloroprene-rubber.

4,617,214

STRIP OR SIMILAR ELEMENT FOR BEING ATTACHED TO AND COVERED BY A MOLDED ARTICLE AND METHOD

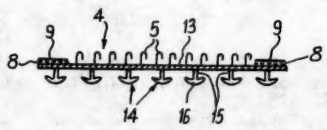
Patrick J. Billarant, Charlotte, N.C., assignor to Aplix S.A., Paris, France

Filed Oct. 5, 1984, Ser. No. 658,336

Claims priority, application France, Oct. 7, 1983, 83 16001

Int. Cl.[4] A44B *21/00*

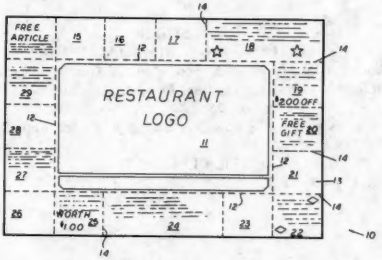
U.S. Cl. 428—40 **3 Claims**



1. A tape intended to be attached to a molded article, said tape comprising a sole having a gripping means on one side thereof together with two spaced-apart marginal areas devoid of said gripping means and adapted to be glued temporarily onto the internal face of a mold in which the molded article is to be formed, said tape also having a second face comprising on at least part of its width anchoring means projecting from said second face for anchoring said tape into the structure of the

molded article, said anchoring means comprising a plurality of stems attached to and extending outwardly from said sole with at least some of said stems having enlarged, anchoring heads thereon, said gripping means and said anchoring means being integrally formed with said sole.

4,617,215
PLACE MAT
Barbara Telesco, P.O. Box 4035, Milford, Conn. 06460
Filed Dec. 5, 1984, Ser. No. 678,350
Int. Cl.[4] B65D *3/02*
U.S. Cl. 428—43 **1 Claim**



1. A placemat for a single setting of dishes and silver at mealtime comprising

a blank of sheet material formed of plain disposable paper stock having an undersurface portion, and an upper surface,

indicia means disposed on said upper surface, and said under surface being formed of said plain paper stock enabling said sheet material to be placed onto a supporting surface so as to be readily removable therefrom,

said indicia means including a main indicia portion spaced inwardly from the peripheral portions of said sheet material to define a circumscribing marginal portion disposed about said main indicia portion,

an easy tear line means circumscribing the periphery of said main indicia portion,

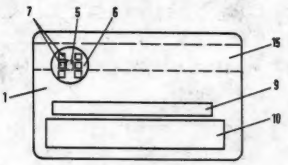
and a plurality of spaced apart tear lines extending transversely of said marginal portion circumscribing said main indicia portion,

said plurality of spaced apart tear lines extending normal to and between said first mentioned tear line and the outer periphery of said sheet material,

said plurality of tear lines dividing said marginal portion into a single row of a plurality of serially connected contiguous separable and distinct portions, each of said separable and distinct portions having an edge portion coincidental with said outer peripheral portion of said sheet material whereby each of said separable and distinct portions can be readily separated from said blank of sheet material along the adjacent tear lines defining said separable and distinct portions without disturbing or separating any other of said separable marginal portions, and

secondary indicia means disposed on each of said separable and distinct marginal portions.

4,617,216
MULTI-LAYER IDENTIFICATION CARD
Yahya Haghiri-Tehrani, and Joachim Hoppe, both of Munich, Fed. Rep. of Germany, assignors to GAO Gesellschaft für Automation und Organisation mbH, Munich, Fed. Rep. of Germany
Continuation of Ser. No. 428,965, Sep. 30, 1982, abandoned, which is a division of Ser. No. 288,496, Jul. 30, 1981, Pat. No. 4,450,024. This application Aug. 19, 1985, Ser. No. 767,057
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1980, 3029939
Int. Cl.[4] B60J *1/00*
U.S. Cl. 428—67 **7 Claims**



1. A multi-layer data card containing accessible, electronically encoded data comprising:

a card composite having an internal core layer (**11, 23, 36**) and at least one covering layer (**12, 13, 20, 26, 32, 40**) laminated by means of heat and pressure on said core layer along one entire side thereof, said core layer having a recess;

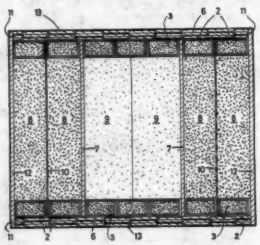
a carrier element (**6, 27**) having a data containing IC-module member (**5**), said carrier element being small relative to the size of the card and further containing access means (**7**) confined to said carrier element by which the data in said module member can be accessed, said carrier element being received within said recess and laminated into the card composite such that said covering layer is generally planar in the region of said carrier element; and

a material (**17, 21/22, 24/25, 33/34, 38/39**) completely surrounding said carrier element and completely occupying the portion of said recess not occupied by said carrier element, said surrounding material being different from the material of the core layer and having a softening point lower than that of said core layer, said surrounding material being soft and elastic under conditions of card manufacture and use for protecting said carrier element against mechanical stresses.

4,617,217
BEAM OR OTHER ELEMENT OF GREAT LENGTH OF A COMPOSITE MATERIAL POLYMERIZED UNDER HEAT AND PRESSURE
Jean A. Michaud-Soret, Paris, France, assignor to Society Nationale Industrielle Aerospatiale, France
Filed Sep. 17, 1984, Ser. No. 651,611
Claims priority, application France, Sep. 19, 1983, 83 14839
Int. Cl.[4] B32B *3/12, 5/08, 5/14, 5/18*
U.S. Cl. 428—71 **20 Claims**

1. A beam of composite material comprising two outer longitudinally extending chords, webs which are parallel to one another, spaced apart and perpendicular to said chords and defining therebetween spaces, a core of a resin foam material filling said spaces, said webs interconnecting said two chords, said beam further comprising prefabricated box structures providing a connection between said chords and said core on each side of said webs, and thin metal bands disposed between

two thin sheets of resin-impregnated fibers constituting heating elements incorporated in said core in intermediate portions of



said core and disposed substantially parallel to said webs and between said webs.

4,617,218

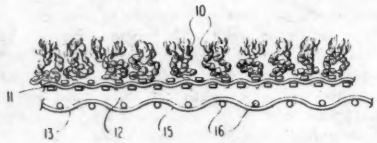
TIGHTLY CURLED, CUT PILE, TUFTED CARPET

Roy A. Cadenhead, Sr., Calhoun, Ga., assignor to Modern Fibers, Inc., Calhoun, Ga.

Continuation-in-part of Ser. No. 515,132, Jul. 19, 1983. This application Sep. 21, 1984, Ser. No. 653,079

Int. Cl.[4] B32B *3/02*

U.S. Cl. 428—92 **28 Claims**



1. A process of making a non-directional, cut pile, tufted carpet having the tightly curled appearance of Persian lamb, comprising the steps of

(a) knitting a carpet facing yarn composed of continuous filaments or spun staple fibers of thermoplastic, synthetic resin into a deknittable fabric, said yarn having a denier of about 600 to 9,000, using knitting needles that are set a fixed distance apart, in the range of about ¼ inch to ⅜ inch,

(b) heating the fabric to a temperature at which the curves and bends generated in the yarn by its knitted configuration are established in the yarn's memory,

(c) cooling the fabric to about room temperature,

(d) deknitting the cooled fabric and rewinding the unravelled yarn under enough tension to restraighten it, this step and said steps (a) through (c) being performed without dyeing the fabric,

(e) tufting the unravelled yarn as facing yarn into a primary carpet backing material, forming a cut pile carpet having a pile height greater than the between-needles distance used in step (a) above, and pile height being in the range of about ⅜ to ½ inch, this step and said step (d) being performed without fluffing the unravelled yarn,

(f) coating the underside of the carpet with a heat-settable adhesive that, when cured, will help anchor the tufts of yarn in the backing material, and

(g) heating the adhesive-coated carpet to a temperature at which the adhesive will set and the facing yarn will reconform to the bends and twists in its memory, thereby producing a finished carpet having the tightly curled appearance of Persian lamb.

4,617,219

THREE DIMENSIONALLY REINFORCED FABRIC CONCRETE

Morris Schupack, 37 Split Rock Rd., South Norwalk, Conn. 06854

Filed Dec. 24, 1984, Ser. No. 685,481

Int. Cl.[4] B32B *5/12*

U.S. Cl. 428—113 **22 Claims**

1. A three-dimensionally reinforced hydraulic cementitious structure comprising at least one layer of non-woven spatial fabric reinforcing material comprised of randomly oriented substantially continuous fibers, said material being encapsulated in the cementitious composition.

4,617,220

SEALING AND TRIMMING STRIPS

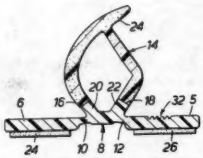
Helmut Ginster, Viersen, Fed. Rep. of Germany, assignor to Draftex Industries Limited, Edinburgh, Scotland

Filed Apr. 26, 1985, Ser. No. 727,527

Claims priority, application United Kingdom, Jun. 26, 1984, 8416259

Int. Cl.[4] E06B *7/16*

U.S. Cl. 428—122 **6 Claims**



1. A sealing or trimming strip for mounting on a flange or the like running around an opening to be sealed or trimmed, comprising

a longitudinal trimming part having a first, longitudinal, base portion of relatively hard plastics or rubber material and second and third longitudinal portions also of relatively hard plastics or rubber material but relatively flexibly supported on the base portion along opposite longitudinally extending edges of the base portion, whereby the strip may be mounted on the said flange or the like by placing the first portion on the flange or the like and bending the said second and third portions with respect to the first portion so as to bring longitudinally extending surfaces of the second and third portions respectively into facing relationship with opposite longitudinally extending side surfaces of the flange or the like and so that the base portion and the second and third portions together define a channel-configuration extending longitudinally along the flange or the like, and

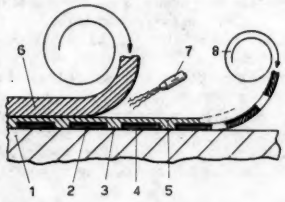
adhesive means on the said longitudinally extending surfaces of the second and third portions for adhesively securing the said longitudinally extending surfaces of the second and third portions to the side surfaces of the flange or the like, thereby attaching the strip to, and so that the said channel-configuration is in embracing relationship with, the flange or the like.

4,617,221

SHEET OF ROOFCOVERING MATERIAL AND METHOD TO APPLY THIS SHEET IN OR AS A ROOFCOVERING

Lieuwe von der Chys, Schulstrasse 14, Bad-Hofgasstein, Austria

Filed Nov. 30, 1984, Ser. No. 677,133
Claims priority, application Switzerland, Dec. 2, 1983, 6470/83
Int. Cl.[4] B32B *3/10, 17/06, 11/10*
U.S. Cl. 428—139 6 Claims



1. A sheet member, used as a roof-covering material comprising:

a first base layer having portions made of a porous material and having a plurality of apertures throughout disposed between said portions of porous material, said base layer having a lower and an upper surface, said lower surface to be applied on a roof;

a second layer of moisture-tight coating disposed over said upper surface of said porous portion of said base layer; and

a third layer of bituminous material disposed on the upper surface of said second layer, whereby said sheet member is adapted for attachment to the roof by heating said third layer of bituminous material while disposing it over said second layer to cause a flow of the molten bitumen from said third layer through said apertures in said base layer to firmly attach said sheet to the roof surface at the locations of said apertures, said flow of said bitumen being prevented from penetrating said porous material portion of said base layer by said second layer whereby the porous base layer allows escape of the vapor trapped under the sheet member to the surrounding and prevents formation of blisters in said sheet member.

4,617,222

PROCESS FOR OBTAINING AREAS OF DISTINCTIVE APPEARANCE ON SYNTHETIC COVERINGS AND THE PRODUCT DERIVED THEREFROM

Jean-Francois Courtoy, Wiltz, and Daniel Marchal, Esch sur Alzette, both of Luxembourg, assignors to Eurofloor S.A., Luxembourg, Luxembourg

Filed Apr. 25, 1984, Ser. No. 603,842
Claims priority, application Luxembourg, Apr. 25, 1983, 84766; Aug. 11, 1983, 84957
Int. Cl.[4] B05D *3/06*
U.S. Cl. 428—142 37 Claims

1. A process of obtaining areas of distinctive appearance on a synthetic covering, the covering including a support layer, including the steps of:

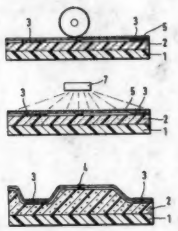
depositing at least a first polymeric coating having at least one radiation initiator therein onto a first selected area of said support layer;

depositing at least a second polymeric coating onto a second selected area of said support layer, at least a portion of said second polymeric coating comprising a crosslinkable monomer;

pre-gelling said deposited coatings;

mechanically graining selected areas of said deposited coatings to form a matted surface;

polymerizing said first polymeric coating via said radiation initiator wherein said first polymeric coating is fixed to said support layer, and wherein said matted surface on said first polymeric coating is fixed thereon; and



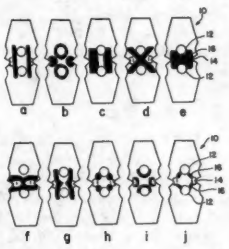
gelling said second polymeric coating to cause fluidization of said second polymeric coating thereby smoothing said matted surface thereon.

4,617,223

REINFORCED PAPERBOARD CARTONS AND METHOD FOR MAKING SAME

Donald F. Hiscock, Columbus; Joe A. Jacomet, Westerville, and Deborah H. Carter, Columbus, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Nov. 13, 1984, Ser. No. 670,415
Int. Cl.[4] B32B *29/00;* D06M *13/34;* B65D *5/62*
U.S. Cl. 428—211 16 Claims



1. A reinforced paperboard carton blank comprising a paperboard blank having therein a pair of fingerholes, fold lines, and a series of openings for receiving a plurality of liquid containers, said blank being impregnated with a polyisocyanate in areas located to increase the tensile strength of said blank adjacent said fingerholes and/or openings such that said container does not readily break when liquid containers are carried therein, said polyisocyanate being a polyisocyanate which reacts with hydroxyl groups in said paperboard to form a cured polyurethane reinforcement.

4,617,224

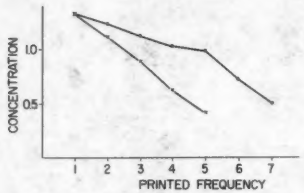
THERMAL TRANSFER RECORDING MEDIUM

Yuji Hotta, Hachioji; Takao Abe, Tokyo; Fumio Ishii, Akishima; Shigehiro Kitamura, Hachioji; Kunihiro Koshizuka, Hino, and Masaki Nakamura, Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 15, 1984, Ser. No. 661,069
Claims priority, application Japan, Oct. 17, 1983, 58-192545
Int. Cl.[4] B41M *5/26*
U.S. Cl. 428—212 20 Claims

1. A thermal transfer recording medium comprising a support, a first coloring agent layer containing a coloring agent and a resin having a softening point of 120° C. or more coated

on said support, and a second coloring agent layer containing a coloring agent and a heat-fusible substance having a melting



point in the range of from 40° C. to 120° C. coated on said first layer, said coloring agents contained in said first and second layers having substantially isochromatic tone.

4,617,225

SHEET-LIKE REINFORCED MATERIAL

Peter Horn, Heidelberg; Edwin Baumann, Schifferstadt; Matthias Marx, Bad Duerkheim, and Peter Gerarts, Ostercappeln, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 24, 1985, Ser. No. 791,113

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1984, 3439461

Int. Cl.[4] B32B *3/26, 5/18, 7/04, 27/04*

U.S. Cl. 428—215 **6 Claims**

1. A sheet-like reinforced material consisting of

A. a core layer comprising a sheet-like textile structure,

B. one or more surface layers comprising an open-cell aminoplast or phenoplast foam and

C. a plastic matrix which is composed of nylon polymerized under alkaline conditions and penetrates both the core layer and the surface layer or layers.

4,617,226

MAGNETIC RECORDING MEDIUM

Nobutaka Yamaguchi; Masahiro Utumi; Masaaki Fujiyama, and Takahito Miyoshi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 21, 1984, Ser. No. 642,911

Claims priority, application Japan, Aug. 22, 1983, 58-152963

Int. Cl.[4] G11B *5/72*

U.S. Cl. 428—216 **12 Claims**

1. A magnetic recording medium comprising a nonmagnetic support, a magnetic recording layer containing ferromagnetic particles, and an intermediate layer provided therebetween, said intermediate layer containing an electroconductive polymer which is an ion-conductive high molecular electrolytic compound, a conjugated π electron electron-conductive high molecular compound, or a charge transfer high molecular complex compound, wherein said electroconductive polymer is present in said intermediate layer in an amount of about 30 wt% or more, based on the weight of the intermediate layer and wherein said magnetic recording layer has a surface electric resistance of less than about 1×10^9 Ω/sq.

4,617,227

ASPHALT ELASTOMERIC BLENDS

Ebon P. Weaver, Naugatuck, Conn., assignor to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Filed Mar. 12, 1985, Ser. No. 710,813

Int. Cl.[4] C08L *95/00;* **B32B** *11/02*

U.S. Cl. 428—220 **11 Claims**

1. An elastomeric composition comprising

(a) asphalt;

(b) preferential plasticizer; and

(c) neutralized sulfonated polymer in a weight ratio of neutralized sulfonated polymer to asphalt of from about 30/70 to about 95/5.

4,617,228

PROCESS FOR PRODUCING ELECTRICALLY CONDUCTIVE COMPOSITES AND COMPOSITES PRODUCED THEREIN

Paul R. Newman, Newbury Park; Leslie F. Warren, Jr., Camarillo, and Edward F. Witucki, Van Nuys, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 4, 1984, Ser. No. 646,717

The portion of the term of this patent subsequent to Apr. 15, 2003, has been disclaimed.

Int. Cl.[4] B05D *3/02, 5/12;* **B32B** *7/00, 5/14*

U.S. Cl. 428—265 **37 Claims**

1. A process for producing an electrically conductive composite which comprises the steps of

(a) contacting a dielectric porous substance with a liquid pyrrole,

(b) contacting said porous substance with a solution of a strong oxidant capable of oxidizing pyrrole to a pyrrole polymer, and

(c) oxidizing said pyrrole by said strong oxidant in the presence of a substantially non-nucleophilic anion, and precipitating a conductive pyrrole polymer in the pores of said substance.

31. An electrically conductive composite produced by the process of claim 1.

4,617,229

NON-WOVEN FABRIC, A BITUMINOUS WATER-PROOFING MEMBRANE BUILT UP ON IT, AND THE USE OF THE FABRIC AS A CARCASS IN SUCH A MEMBRANE

Leif Larsson, Falun, and Bengt Ekdahl, Höganäs, both of Sweden, assignors to AB Mataki, Höganäs and Storalene AB, Falun, both of, Sweden

Filed Dec. 7, 1984, Ser. No. 679,452

Claims priority, application Sweden, Dec. 9, 1983, 8306820

Int. Cl.[4] D04H *1/08*

U.S. Cl. 428—284 **25 Claims**

10. Water-proofing membrane comprising a non-woven fabric coated with bitumen said fabric comprising fibers, a proportion of at least 75% by weight of the fiber quantity of the fabric comprising organic synthetic fibers and cellulose fibers, the organic synthetic fibers constituting at least 10% and at most 90% by weight of said fiber proportion, with the cellulose fibers constituting the remainder of said proportion, the fabric being coated with a binder compatible with bitumen in an amount of at least 10% of the fabric weight and the binder being selected to be thermally stable at least up to 160° C. and to limit the moisture transport ability of at least the cellulose fibers.

4,617,230

LATEX CONTAINING ODOR INHIBITOR

Pravinchandra K. Shah, Sheffield Lake, and George J. Antiffinger, Avon Lake, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 702,862, Feb. 20, 1985, abandoned, which is a continuation of Ser. No. 565,689, Dec. 27, 1983, abandoned. This application Jan. 21, 1986, Ser. No. 820,050

Int. Cl.[4] D04H *1/58*

U.S. Cl. 428—288 **36 Claims**

1. Sterilized nonwoven fabric that has a reduced odor on sterilization comprising nonwoven fibers bonded with a saturated latex prepared by free radical initiation comprising a preponderance of a soft hydrophobic monomer having Tg in the range of about −80° C. to −20° C., a lesser amount of a hard hydrophobic monomer having Tg in the range of about +40° C. to +120° C., a small amount of an unsaturated carbox-

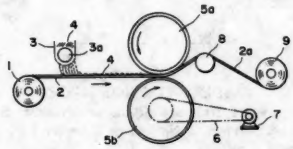
ylic acid, a small amount of N-alkylol acrylamide or methacrylamide, and a sufficient amount of an emulsifier, said latex having admixed therein about 0.01 to 5 weight parts per 100 weight parts of latex solids of an odor inhibition agent selected from amine-type antioxidants and hindered phenols that have the function of reducing the odor that is generated on sterilization of the nonwoven fabric.

4,617,231

ELECTROCONDUCTIVE FILM AND PROCESS FOR PRODUCTION THEREOF

Akira Hamada; Hisao Takahashi, and Keiichi Ohira, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1985, Ser. No. 796,443
Claims priority, application Japan, Nov. 12, 1984, 59-236772
Int. Cl.[4] B32B *5/06*
U.S. Cl. 428—297 **14 Claims**



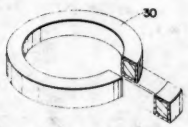
1. An electroconductive film, comprising: a film of a thermoplastic resin, and an electroconductive fiber having an average diameter of 1 to 30 μm and an average length of 1 to 60 mm embedded in and substantially uniformly distributed over the extension of the thermoplastic resin film; said electroconductive film having a thickness of 20 to 200 μm, a specific gravity equal to or larger than that of the thermoplastic resin film, a surface resistivity of 10^0 to 10^5 Ω/□ on at least one surface thereof, a tear strength of 10 g or larger, and a transparency of 40% or above.

4,617,232

CORROSION AND WEAR RESISTANT GRAPHITE MATERIAL

Richard C. Chandler, Bedford Hts., and Lutfi H. Amra, Cleveland Hts., both of Ohio, assignors to Kennecott Corporation, Cleveland, Ohio

Filed Apr. 15, 1982, Ser. No. 368,700
Int. Cl.[4] B32B *5/16, 9/00*
U.S. Cl. 428—328 **4 Claims**



1. An article for use in high temperature environments such as molten metal pumps, furnace liners, and the like, comprising:

(a) an internal composition consisting substantially of a carbonaceous material formed of molded or extruded graphite, particles of aluminum phosphate being distributed in the internal composition; and

(b) a surface composition highly resistant to oxidation and erosion consisting substantially of a layer of silicon carbide, particles of aluminum phosphate being distributed throughout the surface composition.

4,617,233

STRETCHED POLYETHYLENE FILAMENTS OF HIGH STRENGTH AND HIGH MODULUS, AND THEIR PRODUCTION

Toshihiko Ohta, Otsu; Fujio Okada, Shiga, and Kiyokazu Okumoto, Otsu, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed May 21, 1984, Ser. No. 612,240
Claims priority, application Japan, May 20, 1983, 58-89654
Int. Cl.[4] D02G *3/00*
U.S. Cl. 428—364 **2 Claims**

1. Stretched polyethylene filaments of high strength and high modulus, characterized by being made of polyethylene of a weight average molecular weight of not less than 3×10^6, a strength of not less than 50 g/d, an initial modulus of not less than 1,500 g/d, and no observable long period spacing.

4,617,234

MAGNETIC RECORDING MEDIUM

Masashi Aonuma, and Yasuo Tamai, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 20, 1984, Ser. No. 673,318
Claims priority, application Japan, Nov. 21, 1983, 58-219108
Int. Cl.[4] G03C *7/24;* G11B *5/70;* H01F *10/02*
U.S. Cl. 428—328 **12 Claims**

1. An audio cassette tape magnetic recording medium used in the high position comprising a magnetic layer formed by applying a ferromagnetic metal powder together with a binder to a non-magnetic base, wherein said ferromagnetic metal powder has a saturation magnetization (σs) of 120 to 140 emu/g and a specific surface area measured by the BET method of 23 to 35 m^2/g, and said magnetic layer has a coercive force (Hc) of 670 to 770 oersteds (Oe) and a residual magnetic flux density (Br) of about 2000 to 3200 Gauss, wherein the ratio of the residual magnetic flux density to the coercive force is in a range of about 3 to 4.2.

4,617,235

ANTISTATIC SYNTHETIC FIBERS

Osami Shinonome; Takasi Ueda; Yoshihiro Kanmuri, and Fumio Matuoka, all of Kyoto, Japan, assignors to Unitika Ltd., Hyogo, Japan

Filed May 23, 1984, Ser. No. 612,949
Claims priority, application Japan, May 23, 1983, 58-91223; Dec. 14, 1983, 58-236579
Int. Cl.[4] D02G *3/00*
U.S. Cl. 428—374 **9 Claims**

1. Antistatic synthetic fibers composed of (A) a fiber-forming polyester and (B) a block copolyether ester synthesized from four components (i), (ii), (iii) and (iv), wherein component (i) is a poly alkylene oxide which is selected from the group consisting of polyethylene oxide, polypropylene oxide, polyethylene oxide-polypropylene oxide copolymer and ethylene oxide or propylene oxide adduct of a bisphenol compound; component (ii) is a dicarboxylic acid which is selected from the group consisting of adipic acid, sebacic acid, terephthalic acid, isophthalic acid and naphthalic acid; component (iii) is a diol which is selected from the group consisting of ethylene glycol, propylene glycol, diethylene glycol, 1,4-cyclohexanedimethanol and xylylene glycol; and component (iv) is 5-alkali metal sulfoisophthalic acid, the block copolyether ester (B) being incorporated in the polyester (A) substantially continuously along the fiber axis in the form of a plurality of spaced-apart bands, logitudinally intersecting the polyester (A) portion of the fibers, or a network formed of connecting fibrils of component (B).

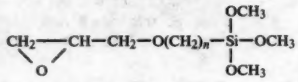
4,617,236

ADDITIVES TO POLYESTER TIRE YARN OVERFINISH TO REDUCE DIP PENETRATION

Robert M. Marshall, Chester, Va., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Oct. 21, 1985, Ser. No. 789,879
Int. Cl.[4] B32B *25/00*; D06M *13/52*
U.S. Cl. 428—391 17 Claims

1. In a finish composition for polyester continuous filament yarn to be processed into tire cord, said composition comprising an aqueous emulsion of a lubricant selected from the group consisting of hexadecyl stearate, butyl stearate, natural or modified glycerides, and mineral oil; glycerol monooleate; decaglycerol tetraoleate; polyoxyethylene tall oil fatty acid; sulfonated glycerol trioleate; polyoxyethylene tallow amine; and 0–30 parts by weight of the non-aqueous portion of the emulsion of a silane having the structural formula



wherein n=2 to 5;

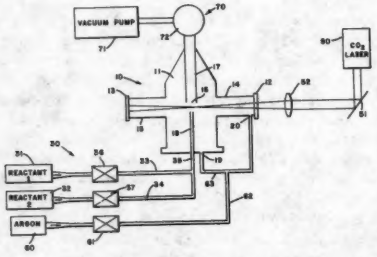
the improvement wherein said aqueous emulsion additionally comprises dispersed therein paraffin wax in an amount sufficient to impart reduced resorcinol-formaldehyde-latex wicking to said tire cord.

4,617,237

PRODUCTION OF CONDUCTIVE METAL SILICIDE FILMS FROM ULTRAFINE POWDERS

Arunava Gupta, Madison; Gary A. West, Dover, and James T. Yardley, Morristown, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 14, 1984, Ser. No. 609,628
Int. Cl.[4] B05D *3/06, 5/12*; B32B *9/04, 19/00*
U.S. Cl. 428—446 19 Claims



18. The coated article comprising a substrate and a conductive film, said conductive film comprising polycrystalline metal silicide and free silicon in the range of about 5 to about 50 weight percent of said film and having a resistivity of less than about 100 $\mu\Omega$-cm.

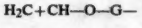
4,617,238

VINYLOXY-FUNCTIONAL ORGANOPOLYSILOXANE COMPOSITIONS

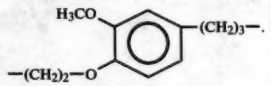
James V. Crivello, Saratoga, and Richard P. Eckberg, Roundlake, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 364,303, Apr. 1, 1982, abandoned. This application Aug. 7, 1985, Ser. No. 763,758
Int. Cl.[4] B32B *9/06*
U.S. Cl. 428—452 40 Claims

1. An organopolysiloxane having at least 1 Si-bonded vinyloxy functional group of the formula:



wherein G has the formula:



4,617,239

PAPER COATING AGENT

Hitoshi Maruyama; Koichi Kajitani, and Makoto Shiraishi, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Division of Ser. No. 429,231, Sep. 30, 1982, abandoned. This application Aug. 30, 1984, Ser. No. 645,708
Claims priority, application Japan, Oct. 5, 1981, 56-158974; Oct. 7, 1981, 56-160658; Mar. 23, 1982, 57-46676
Int. Cl.[4] B32B *9/06*
U.S. Cl. 428—452 14 Claims

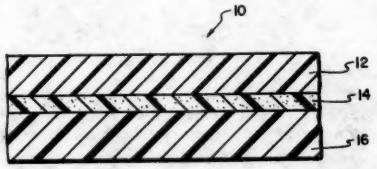
1. A method of coating paper to improve the surface strength and printability of the paper, comprising applying an effective amount of a silicon-containing modified polyvinyl alcohol to said paper in the form of an alkaline aqueous solution, wherein the silicon-containing modified polyvinyl alcohol is a water soluble product obtained by an alcoholysis of a copolymer of a vinyl ester and an olefinic unsaturated monomer containing silicon in the molecule.

4,617,240

COEXTRUDED FILM OF POLYPROPYLENE, POLYPROPYLENE BLEND, AND NYLON

Duane A. Krueger, Neenah, and Thomas W. Odorzynski, Green Bay, both of Wis., assignors to American Can Company, Greenwich, Conn.

Division of Ser. No. 417,674, Sep. 13, 1982. This application Jul. 30, 1984, Ser. No. 635,631
The portion of the term of this patent subsequent to Sep. 30, 1999, has been disclaimed.
Int. Cl.[4] B32B *27/34*
U.S. Cl. 428—476.1 8 Claims



1. A coextruded multiple layer plastic film, comprising:

(a) a layer of polypropylene;

(b) a layer of nylon; and

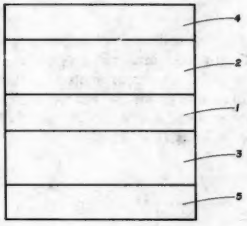
(c) between said nylon and polypropylene layers, a layer of a functionally adhesive blend of a copolymer of maleic anhydride grafted onto a polypropylene backbone and an ungrafted polypropylene, said graft copolymer containing from about 0.1% to 2.5% maleic anhydride based on the total weight of the graft copolymer, said graft copolymer comprising between about 5% and 30% by weight of the blend, and said ungrafted polypropylene comprising between about 70% to 95% by weight of the blend.

4,617,241

LINEAR POLYETHYLENE STRETCH/SHRINK FILMS

Walter B. Mueller, Inman, S.C., assignor to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Filed Jan. 23, 1984, Ser. No. 573,077
Int. Cl.[4] B32B *27/08*
U.S. Cl. 428—520 6 Claims



1. In a multilayer, thermoplastic packaging film having a layer of ethylene-vinyl acetate copolymer and a layer of linear low density polyethylene, the improvement wherein:

(a) said film comprises at least five layers;

(b) the material of the central or core layer is selected from the group consisting of:

(1) ethylene-vinyl acetate copolymers, and

(2) blends of ethylene-vinyl acetate copolymer with linear low density polyethylene;

(c) intermediate layers adjacent each side of the core layer, said intermediate layers consisting essentially a linear low density polyethylene;

(d) two surface layers consisting essentially of a copolymer of ethylene-vinyl-acetate;

(e) said film having a shrink tension at 205° F. in the transverse and longitudinal directions of approximately 400 p.s.i. or greater; and,

(f) said film having an elongation at break at 73° F. in both transverse and longitudinal directions of at least approximately 200%.

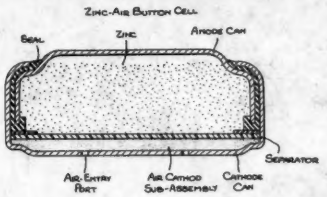
4,617,242

ORGANIC SILICONATE ADDITIVE FOR ALKALINE ZINC ELECTROCHEMICAL CELLS

Robert B. Dopp, Madison, Wis., assignor to Rayovac Corporation, Madison, Wis.

Continuation of Ser. No. 543,429, Oct. 19, 1983, abandoned.
This application Apr. 8, 1985, Ser. No. 721,136
Int. Cl.[4] H01M *4/00*
U.S. Cl. 429—27 27 Claims

1. An alkaline electrochemical comprising an air cathode sub-assembly, with a means for supplying air to said cathode sub-assembly, a zinc anode an organic siliconate in contact with said anode, an electrolyte in contact with the zinc anode



and a non-metallic separator between the cathode and the anode.

4,617,243

ELECTROCHEMICAL BATTERY

Takashi Nogami, Toyonaka, and Masayoshi Nawa, Minoo, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jul. 12, 1982, Ser. No. 397,238
Claims priority, application Japan, Aug. 27, 1981, 56-134690
Int. Cl.[4] H01M *6/14*
U.S. Cl. 429—194 5 Claims

1. An electrochemical cell capable of generating an electromotive force, comprising:

a cathode-type electrode;

an anode-type electrode; and

an organic solvent;

wherein said cathode-type electrode comprises a first activated elemental carbon part doped with a cationic electrolyte species, and said anode-type electrode comprises a second activated elemental carbon part doped with an anionic electrolyte species; said first and second carbon part having a specific surface area of 100–2,500 m^2/g; whereby by immersing said electrodes in the solvent, said dopants are dissolved out of said solvent.

4,617,244

ADDITIVE FOR ELECTROLYTE OF LEAD-ACID BATTERIES

Roland M. Greene, 3575 S. Main, Nibley, Utah 84321

Filed Jun. 24, 1985, Ser. No. 747,927
Int. Cl.[4] H01M *6/04*
U.S. Cl. 429—203 9 Claims

1. A lead-acid storage battery containing as an electrolyte for each cell, an aqueous sulfuric acid solution containing an activating amount of an additive comprising a mixture of an iron chelate and a magnesium salt or chelate, the chelates for the iron and magnesium being formed from chelating agents which form 4 to 6 membered rings with the iron and magnesium and which contain a member of the group consisting of amine groups, phenol groups and aldehyde groups.

4,617,245

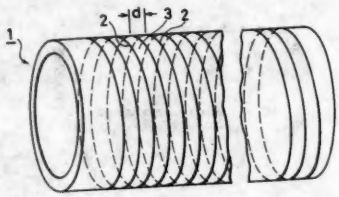
LIGHT RECEIVING MEMBER HAVING TAPERED REFLECTIVE SURFACES BETWEEN SUBSTRATE AND LIGHT RECEIVING LAYER

Shigemori Tanaka; Fumio Sumino; Keiji Kubo, all of Tokyo; Masafumi Hisamura; Hitoshi Toma, both of Kawasaki, and Naoto Fujimura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 1, 1985, Ser. No. 697,141
Claims priority, application Japan, Feb. 9, 1984, 59-22674
Int. Cl.[4] G03G *15/00, 15/04*
U.S. Cl. 430—58 37 Claims

1. A light receiving member for image formation with incident light of wavelength λ provided with a coating layer containing a light receiving layer on a metallic cylindrical substrate, which comprises the coating layer having a regu-

larly changed thickness within the minute width of the coating layer, said substrate having tapered reflective surfaces of a



height of at least $\lambda/2$ formed vertically to the longitudinal direction of the metallic cylinder and said regularly changed thickness being formed by said tapered reflective surfaces.

4,617,246

PHOTOCONDUCTIVE MEMBER OF A GE-SI LAYER AND SI LAYER

Kozo Arao, Yokohama, and Keishi Saitoh, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 31, 1983, Ser. No. 547,241

Claims priority, application Japan, Nov. 4, 1982, 57-194360; Nov. 5, 1982, 57-194354; Nov. 6, 1982, 57-195059; Nov. 8, 1982, 57-196398

Int. Cl.⁴ G03G 5/082

U.S. Cl. 430—65 **40 Claims**

1. A photoconductive member comprising a support for photoconductive member and light receiving layer, said light receiving layer comprising a first layer region comprising an amorphous material containing $Ge_x Si_{1-x}$ $(0.95<x\leqq 1)$ and atoms of at least one of hydrogen or halogen, and a second layer region exhibiting photoconductivity comprising an amorphous silicon material containing atoms of at least one of hydrogen or halogen; said two layer regions being provided in succession from the support side.

4,617,247

IMPROVED SENSITIZER DYES FOR POLYVINYLCARBAZOLE ELECTROPHOTOGRAPHIC COMPOSITIONS

Kiyosuke Suzuki, Saitama; Toshiaki Fukuma, Tokyo, and Tatsuru Sato, Chiba, all of Japan, assignors to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP84/00256, § 371 Date Jan. 10, 1985, § 102(e) Date Jan. 10, 1985, PCT Pub. No. WO84/04825, PCT Pub. Date Dec. 6, 1984

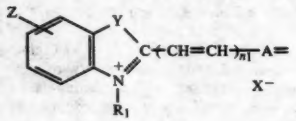
PCT Filed May 21, 1984, Ser. No. 697,580

Claims priority, application Japan, May 24, 1983, 58-90963

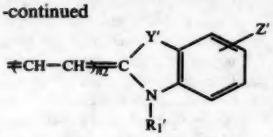
Int. Cl.⁴ G03G 5/06

U.S. Cl. 430—81 **16 Claims**

1. A photosensitive material for electrophotography comprising polyvinylcarbazole or a derivative thereof and a sensitizing dye, wherein said sensitizing dye is represented by the general formula



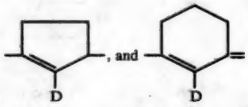
-continued



wherein Y represents S or

; Y' represents S or

(wherein R_2, R_3, R_2' and R_3' each represents an alkyl group; said R_2 and R_3 together and said R_2' and R_3' together may form a ring); Z and Z' each represents a halogen atom, a nitro group, a cyano group, or an alkylsulfonyl group; R_1 and R_1' each represents a substituted or unsubstituted alkyl group; A is selected from —CH=CH—CH=,



(wherein D represents a halogen atom or

wherein R_4 and R_5 each represents a substituted or unsubstituted alkyl or phenyl group); n_1 and n_2 each represents 0 or a natural number and $n_1+n_2\geqq 2$; and X^- represents an anion.

4,617,248

DOPED PHOTOCONDUCTIVE FILM INCLUDING SELENIUM AND TELLURIUM

Kenkichi Tanioka, Tokyo; Keiichi Shidara, Tama; Takao Kuriyama, Sagamihara; Yukio Takasaki, Kawasaki; Tadaaki Hirai, Koganei; Yasuhiko Nonaka, and Eisuke Inoue, both of Mobara, all of Japan, assignors to Nippon Hoso Kyokai and Hitachi, Ltd., both of Tokyo, Japan

Filed May 20, 1985, Ser. No. 736,149

Claims priority, application Japan, May 21, 1984, 59-100535

Int. Cl.⁴ G03G 5/08, 5/09

U.S. Cl. 430—95 **13 Claims**

1. A photoconductive film mainly consisting of Se and sensitized by adding tellurium into a portion in the direction of thickness of the photoconductive film so as to form a Te-doped region, in which at least one selected from a group consisting of such oxides and fluorides that form negative space charges in selenium and such elements that belong to the group II, III or VII and form negative space charges in selenium is contained in either of at least a portion of the Te-doped region and at least a portion of the region adjacent to said Te-doped region, or in both of said portions, at an average weight %

concentration of not smaller than 10 ppm and not larger than 1%, wherein a film thickness where such dopant that forms negative space charges in selenium is contained is selected to be not smaller than 20 Å and not larger than 90 Å.

4,617,249

DISPERSION POLYMERIZATION PROCESS FOR TONER COMPOSITIONS

Christopher K. Ober, Oakville, and Kar P. Lok, Sarnia, both of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 16, 1985, Ser. No. 755,391
Int. Cl.[4] G03G *11/00, 9/08*
U.S. Cl. 430—137 **12 Claims**

1. An improved dispersion polymerization process for the preparation of polymer particles consisting essentially of (1) providing a solvent medium having dispersed therein steric stabilizers selected from the group consisting of hydroxy celluloses, poly(acrylic acid), poly(vinyl butyral), poly(vinyl pyridines), poly(vinyl pyrrolidone), and their copolymers, monomers, and initiator compounds; (2) subsequently adding thereto a crosslinking compound; (3) affecting polymerization of the resulting mixture by heating; and (4) thereafter separating the particles formed of a diameter of from about 5 to about 20 microns.

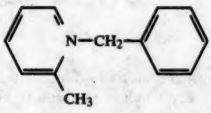
4,617,250

LIGHT-SENSITIVE DIAZO COMPOSITION WITH ACIDIC COMPOUNDS FOR USE WITH LITHOGRAPHIC PRINTING PLATES

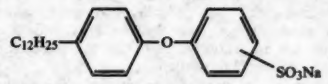
Eiji Nakakita; Akinobu Koike; Toshiyuki Sekiya; Hiroshi Misu, and Nobuyuki Kita, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 1, 1984, Ser. No. 616,040
Claims priority, application Japan, Jun. 1, 1983, 58-98684
Int. Cl.[4] G03C *1/60, 1/54;* G03F *7/08*
U.S. Cl. 430—175 **4 Claims**

1. A lithographic printing plate comprising a light-sensitive composition on an aluminum support which has been pretreated to render its surface hydrophilic, wherein said light-sensitive composition comprises in admixture (1) a light-sensitive, organic solvent soluble and substantially water-insoluble diazo resin which is the reaction product of a water-soluble, light-sensitive condensate of an aromatic diazonium compound and a organic condensing agent with a halogenated Lewis acid or a salt thereof, (2) a substantially water-insoluble, film-forming organic high-molecular weight compound having an acid value of from 10 to 200, (3) a polynuclear aromatic sulfonic acid or a salt thereof, and (4) a salt-forming organic dye compound, wherein the amount of diazo resin ranges from 3 to 30 wt % and the amount of the high-molecular weight compound ranges from 97 to 70 wt %, based on the combined total weight thereof, wherein the amount of polynuclear aromatic sulfonic acid or a salt thereof ranges from 7 to 40 wt % based on the weight of the diazo resin, wherein the salt-forming organic dye compound is incorporated in the light-sensitive layer in an amount of from 5 to 100 wt % based on the weight of the diazo resin and wherein said polynuclear aromatic sulfonic acid or a salt thereof is selected from the group consisting of sodium t-butyl-naphthalenesulfonate, anthraquinone-2-sulfonic acid, sodium isopropylnaphthalenesulfonate,



salt of t-butylnaphthalene-sulfonic acid, 2-methoxy-4-hydroxy-5-benzoylbenzene sulfonate of ethyl violet, sodium anthraquinone-2-sulfonate,



or arthraquinone-2-sulfonate salt of ethyl violet.

4,617,251

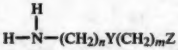
STRIPPING COMPOSITION AND METHOD OF USING THE SAME

Joseph J. Sizensky, Seekonk, Mass., assignor to Olin Hunt Specialty Products, Inc., Palisades Park, N.J.

Filed Apr. 11, 1985, Ser. No. 721,965
Int. Cl.[4] C11D *7/32, 7/52;* C23D *17/00;* G03C *17/00*
U.S. Cl. 430—256 **11 Claims**

1. A method for removing a positive resist from a substrate, wherein said positive resist contains a novolak resin and a diazo ketone sensitizer and has been post-baked at a temperature of at least about 150°, comprising contacting said positive resist with a non-aqueous stripping composition which is essentially free of phenol compounds and halogenated hydrocarbon compounds and consisting essentially of:

(a) from about 2 percent to about 98 percent by weight of an amine compound selected from the group consisting of compounds having the formula:



wherein n and m are each independently an integer ranging from 1-5, inclusive; Y is either —O— or —NH—; and Z is —H, —OH or —NH_2; and mixtures thereof; and

(b) from about 98 to about 2 percent by weight of an organic polar solvent selected from the group consisting of N-methyl-2-pyrrolidinone, tetrahydrofurfuryl alcohol, isophorone, dimethyl sulfoxide, dimethyl adipate, dimethyl glutarate, sulfolane, γ-butyrolactone, N,N,-dimethylacetamide and mixtures thereof.

4,617,252

ANTIREFLECTIVE COATINGS FOR USE IN THE MANUFACTURE OF SEMI-CONDUCTOR DEVICES, METHODS AND SOLUTIONS FOR MAKING SUCH COATINGS, AND THE METHOD FOR USING SUCH COATINGS TO ABSORB LIGHT IN ULTRAVIOLET PHOTOLITHOGRAPHY PROCESSES

William F. Cordes, III, East Greenwich, and Alfred T. Jeffries, III, Providence, both of R.I., assignors to Philip A. Hunt Chemical Corporation, Palisades Park, N.J.

Continuation-in-part of Ser. No. 510,212, Jul. 1, 1983, abandoned. This application Jun. 12, 1984, Ser. No. 619,737
Int. Cl.[4] G03C *1/84;* G03F *7/26*
U.S. Cl. 430—272 **11 Claims**

1. A method of reducing reflections during the exposure of a photoresist layer in a semi-conductor device comprising:

(a) applying an antireflective layer comprising a polyphenylquinoxaline and having a thickness of less than about 1.0 micron to a semi-conductor device comprising a silicon wafer having at least one semi-conductor element and a layer of a non-conductor on one of its surfaces;

(b) applying on top of the antireflective layer a photoresist layer comprising a material whose solubility characteristics in certain solvents is affected by exposure to ultraviolet radiation having a wavelength of from about 500 to about 350 nm, to obtain a semi-conductor device carrying an antireflective layer underneath a photoresist layer;

(c) selectively exposing a portion of the photoresist layer to ultraviolet light having a wavelength of from about 500 to about 350 nm, whereby at least a portion of the ultraviolet

light passes through the photoresist layer into the antireflective layer and is absorbed by the antireflective layer;

(d) developing the photoresist layer to remove a portion of the photoresist layer from the semi-conductor device and to uncover a portion of the polyphenylquinoxaline layer underlying the photoresist layer;

(e) removing the portion of the polyphenylquinoxaline layer left uncovered in step (d) to uncover a portion of the layer underlying the polyphenylquinoxaline layer;

(f) removing the portion of the layer underlying the polyphenylquinoxaline layer left uncovered in step (e); and

(g) removing the portion of the photoresist and polyphenylquinoxaline layers left remaining after step (f) above.

4,617,253

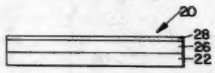
POLYMERIC PYRIDINIUM YLIDES AND PRODUCTS PREPARED FROM SAME

Lloyd D. Taylor, Lexington, Mass., and Michael K. Haubs, Bad Kreuznach, Fed. Rep. of Germany, assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 6, 1984, Ser. No. 617,726

Int. Cl.[4] G03C *5/16*; B05D *3/06*

U.S. Cl. 430—323 **15 Claims**



1. A method for preparing an article carrying a layer of water-insoluble or hydrophobic protective polymer which comprises subjecting to actinic radiation, an article comprising a support carrying a layer of photosensitive polymeric pyridinium ylide, said article having between said support and said photosensitive polymeric pyridinium ylide, a layer of material etchable by physical or chemical means, said actinic radiation being sufficient to convert said polymeric ylide to a water-insoluble or hydrophobic N-acyl-diazepine protective polymer.

4. A method for forming a photoresist which comprises the steps of: selectively exposing to actinic radiation, a photosensitive article comprising a support carrying a layer of metal, and having over said metallic layer, a layer of photosensitive polymeric ylide, said selective exposure being effected by exposing predetermined areas of said photosensitive layer to said actinic radiation while shielding other predetermined areas of said photosensitive layer from exposure to said actinic radiation, said actinic radiation being sufficient to convert said photosensitive polymeric ylide in said areas of exposure to a water-insoluble or hydrophobic N-acyl-diazepine protective polymer; and removing said photosensitive polymeric ylide from said areas of non-exposure.

4,617,254

PROCESS FOR FORMING DETAILED IMAGES

Akihiro Kinoshita, Munakata; Yohichi Namariyama, Koga, and Hiromi Higashi, Zushi, all of Japan, assignors to Chisso Corporation, Ohsaka, Japan

Continuation of Ser. No. 548,626, Nov. 4, 1983, abandoned. This application Apr. 16, 1985, Ser. No. 723,009

Claims priority, application Japan, Nov. 4, 1982, 57-193642

Int. Cl.[4] G03C *5/00*

U.S. Cl. 430—326 **20 Claims**

1. A process for forming detailed positive type images which comprises:

providing a base;

applying a resist solution to the base, said resist solution comprising an organic solvent and 1–15% by weight of at least one of a homopolymer of methyl vinyl ketone and a copolymer thereof with a comonomer selected from the group consisting of: vinyl acetate, acrylonitrile, styrene, α-methylstyrene, vinyltoluene, chlorostyrene, bromostyrene, nitrostyrene, cyanostyrene, methyl methacrylate, ethyl methacrylate, butyl methacrylate, ethyl acrylate and octyl acrylate, wherein the proportion of methyl vinyl ketone in the copolymer is at least 10% by mol, to form a coating on the base;

imagewise irradiating the coating with far-ultraviolet light;

developing the resulting coating with a liquid solvent as a developer, said liquid selected from the group consisting of at least one cellosolve compound and at least one cellosolve compound mixed with a lower alcohol wherein the cellosolve compound is expressed by the formula

$$R^4—O—CH_2CH_2OH$$

wherein

R^4 represents an alkyl group of 1 to 4 carbon atoms; and at leasst one of rinsing and washing the base after the developing.

4,617,255

COLOR COUPLER-CONTAINING PHOTOGRAPHIC MATERIAL

Erich Wolff, Solingen; Hans Langen, Bonn, and Rudolf Braden, Odenthal, all of Fed. Rep. of Germany, assignors to Agfa Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

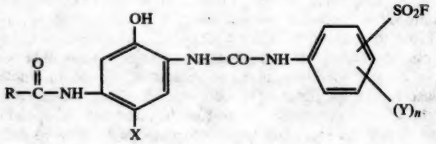
Filed Nov. 18, 1985, Ser. No. 798,911

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1984, 3443700

Int. Cl.[4] G03C *1/40*

U.S. Cl. 430—553 **2 Claims**

1. Light-sensitive colour photographic recording material having at least one silver halide emulsion layer and, associated therewith, a non-diffusing phenolic cyan coupler having a 2-phenylureide group, characterised in that the cyan coupler has the following formula:



wherein:

R = a ballast group;

X = H or a leaving group which may be separated during colour coupling;

Y = halogen, alkyl, alkoxy, aryl or alkylthio;

n = 0–2; if n = 2, the radicals Y may be the same or different.

4,617,256

COLOR PHOTOGRAPHIC COLOR COUPLER-CONTAINING RECORDING MATERIAL

Friedrich-Wilhelm Kunitz, Leverkusen, and Karl-Wilhelm Schranz, Odenthal-Hahnenberg, both of Fed. Rep. of Germany, assignors to Agfa Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

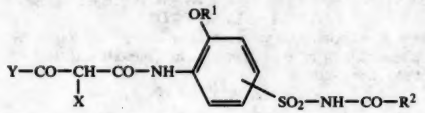
Filed Nov. 4, 1985, Ser. No. 794,705

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1984, 3441525

Int. Cl.[4] G03C *1/40*

U.S. Cl. 430—557 **4 Claims**

1. A colour photographic recording material with at least one photosensitive silver halide emulsion layer and a non-diffusing α-acylacetanilide yellow coupler associated therewith the anilide group of which is substituted by an N-acylsulphamoyl group, characterised in that the yellow coupler corresponds to the following formula:



wherein:

Y represents an aliphatic or cycloaliphatic radical;

X represents a hydrogen atom or a group which can be split off during colour coupling;

R^1 represents an alkyl radical having from 12 to 20 carbon atoms; and

R^2 represents an alkyl radical having from 1 to 4 carbon atoms.

4,617,257

HEAT DEVELOPABLE LIGHT-SENSITIVE MATERIAL

Satoru Sawada, and Toshinao Ukai, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

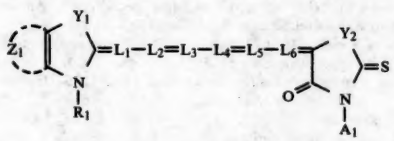
Filed Mar. 19, 1985, Ser. No. 713,721

Claims priority, application Japan, Mar. 19, 1984, 59-52774

Int. Cl.[4] G03C *1/02*

U.S. Cl. 430—560 7 Claims

1. A heat developable light-sensitive material which is sufficiently stable to be stored for a long time at a predetermined sensitivity, comprising a light-sensitive silver halide spectrally sensitized with a dye represented by formula (I) or (II):



(I)

wherein

R_1 represents an alkyl group or a substituted alkyl group,

A_1 represents an alkyl group, a substituted alkyl group, a phenyl group, a substituted phenyl group, a pyridyl group, or a substituted pyridyl group,

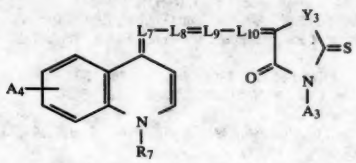
Y_1 represents an oxygen atom, a sulfur atom, a selenium atom,

(wherein R_3 and R_4 each represents a methyl group or an ethyl group), =N—R_5 (wherein R_5 represents an alkyl group or a substituted alkyl group containing not more than 5 carbon atoms, or an allyl group), or —CH=CH—,

Y_2 represents an oxygen atom, a sulfur atom, or =N—A_2, (wherein A_2 represents an alkyl or substituted alkyl group containing not more than 5 carbon atoms, an allyl group, a phenyl group, a substituted phenyl group, a pyridyl group, or a substituted pyridyl group),

Z_1 represents atoms forming an unsubstituted or substituted benzene or naphthalene ring; and

L_1 through L_6 each represents a methine or substituted methine group, wherein L_2 and L_4 or L_4 and L_6 can bonded to each other to form a 5- or 6-membered ring;



(II)

wherein

Y_3, R_7, and A_3 represent the same atoms or groups as defined for Y_2, R_1, and A_1, respectively;

A_4 represents an alkyl group containing from 1 to 4 carbon atoms, a halogen atom, a phenyl group, a hydroxyl group, an alkoxy group containing from 1 to 4 carbon atoms, a carboxyl group, an alkoxycarbonyl group, an alkylsulfamoyl group, an alkylcarbamoyl group, an acyl group, a cyano group, a trifluoromethyl group, or a nitro group; and

L_7 through L_{10} each represents a methine or substituted methine group, wherein the substituent is an alkyl group, a substituted alkyl group, an aryl group, or an alkoxy group, wherein said material further comprises at least one of a compound being capable of releasing a mobile dye corresponding to or inversely corresponding to the reduction of silver halide to silver at elevated temperatures and an alkali or alkali precursor.

4,617,258

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Hiroshi Menjo, Hachioji; Nobuo Sakamoto, Tsukui, and Yoshikazu Watanabe, Akishima, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 710,524, Mar. 12, 1985, abandoned, which is a continuation of Ser. No. 480,666, Mar. 31, 1983, abandoned. This application Mar. 25, 1986, Ser. No. 843,824

Claims priority, application Japan, Apr. 9, 1982, 57-59904

Int. Cl.[4] G03C *1/06, 1/34*

U.S. Cl. 430—566 12 Claims

1. A silver halide photographic material containing 40–500 mg. per 100 g of silver, of a water-soluble compound comprising a metal selected from ruthenium, rhodium, palladium, osmium, iridium, and platinum and having a molecular weight of at least 100; and 1.2 to 120 mg of a black-and-white silver halide developing agent per 100 g of silver.

4,617,259

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Tadashi Ogawa; Satoshi Nagaoka, and Yuichi Ohashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 26, 1985, Ser. No. 780,497

Claims priority, application Japan, Sep. 26, 1984, 59-200997

Int. Cl.[4] G03C *1/02, 1/06, 1/08, 1/46*

U.S. Cl. 430—569 9 Claims

1. A silver halide color photographic material comprising a support having coated thereon at least one silver halide emulsion layer containing a group of silver halide grains having a relation that the larger an amount of silver of a grain is, the larger an amount of a content of silver iodide therein is, at a correlative coefficient of not less than 0.7 between a silver halide crystal grain size and a silver iodide content therein.

4,617,260

RIA ASSAY FOR HBCAG

William J. McAleer, Ambler, and William J. Miller, North Wales, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 27, 1981, Ser. No. 238,780
Int. Cl.[4] G01N *53/00, 33/545;* C12Q *1/70*
U.S. Cl. 435—5 8 Claims

1. A method for detecting HBcAg in a biological fluid which comprises:

contacting a plasma fraction having an amount of antibody which binds to HBcAg sufficient to permit detection of HBcAg in a biological fluid by immunoradiometric assay but having no detectible HBsAg with a suitable support under conditions sufficient to coat said support with said plasma fraction contacting said HBsAg-free plasma-fraction-coated support with a proteinaceous material under conditions such that substantially all areas of the support not coated with said HBsAg-free plasma fraction are coated with said proteinaceous material to minimize non-specific adsorption incubating said coated support with the biological fluid under conditions such that any HBcAg in said biological fluid binds to said support washing said coated support incubating said washed coated support with a radiolabelled plasma fraction, having an amount of antibody which binds to HBcAg sufficient to permit detection of HBcAg in a biological fluid by immunoradiometric assay but having no detectible HBsAg under conditions such that the radiolabelled plasma fraction binds to the washed support and measuring the radioactivity bound to the support.

4,617,261

PROCESS FOR LABELING NUCLEIC ACIDS AND HYBRIDIZATION PROBES

Edward L. Sheldon, III; Corey H. Levenson, both of Oakland; Kary B. Mullis, Kensington; Henry Rapoport, and Robert M. Watson, both of Berkeley, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

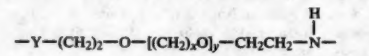
Continuation-in-part of Ser. No. 683,263, Dec. 18, 1984, which is a continuation-in-part of Ser. No. 591,811, Mar. 21, 1984. This application Oct. 25, 1985, Ser. No. 791,332
Int. Cl.[4] C12Q *1/68;* G01N *33/48*
U.S. Cl. 435—6 33 Claims

1. A process for labeling a partially double-stranded nucleic acid which comprises the steps of:

(a) contacting the nucleic acid with one or more labeling compositions of the formula:

[A—[B—L

wherein A is an alkylating intercalation moiety, B is a divalent organic moiety having the formula:



where Y is O, NH or N—CHO, x is a number from 1 to 4 and y is a number from 2 to 4, and L is a monovalent label moiety, wherein B is exclusive of any portion of the intercalation and label moieties, said contacting occurring so as to cause the alkylating intercalation moiety of the labeling composition to intercalate into the nucleic acid to form a complex; and

(b) activating the complex so as to induce the alkylating intercalation moiety to bond covalenty to at least one of the nucleic acid strands.

4,617,262

ASSAYING FOR CIRCULATING IMMUNE COMPLEXES WITH LABELED PROTEIN A

Peter E. Maxim, Downingtown, and Robert W. Veltri, West Chester, both of Pa., assignors to CooperBiomedical, Inc., Palo Alto, Calif.

Filed Jul. 22, 1983, Ser. No. 516,465
Int. Cl.[4] G01N *33/53, 33/535, 33/539*
U.S. Cl. 435—7 21 Claims

1. A method for assaying circulating immune complexes in mammalian serum which comprises

(a) contacting said circulating immune complexes in solution in said serum with a staphylococcal protein-A(SPA) linked to a detectable label, whereby a CIC-protein-A-label complex is formed,

(b) selectively precipitating said CIC-SPA-label complex by contacting the complex with polyethylene glycol,

(c) separating said precipitated CIC-SPA-label complex from said serum,

(d) measuring the quantity of said label present in said precipitate, and

(e) comparing the measured quantity of the label with at least one standard prepared by subjecting a solution containing a known amount of CIC or functional equivalent material to the same assay.

4,617,263

METHOD FOR QUANTITATIVE DETERMINATION OF ACETYLPUTRESCINE IN A MIXTURE

Hideaki Yamada, Kyoto; Shogo Otsuji, Kagoshima; Kimiyasu Isobe, Konan; Kuniyoshi Matsunaga, Ichinomiya, and Tadahiko Inukai, Nagoya, all of Japan, assignors to Amano Seiyaku Kabushiki Kaisha, Aichi, Japan

Division of Ser. No. 495,677, May 18, 1983, Pat. No. 4,550,078. This application Sep. 13, 1985, Ser. No. 776,162
Claims priority, application Japan, Sep. 14, 1982, 57-158848
Int. Cl.[4] C12Q *1/26*
U.S. Cl. 435—25 1 Claim

1. A method for the quantitative determination of acetylputrescine in an aqueous mixture which comprises:

(a) subjecting the aqueous mixture to an enzymatic oxidative decomposition reaction with acetylputrescine oxidase to form hydrogen peroxide as a byproduct, and

(b) determining the amount of the hydrogen peroxide.

4,617,264

PRETREATMENT METHOD AND COMPOSITION

Gordon R. Whiteley, Palo Alto; Cynthia G. Pritchard, Mountain View, and Sharon S. Barrett, East Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Nov. 4, 1983, Ser. No. 549,522
Int. Cl.[4] C12Q *1/04*
U.S. Cl. 435—34 22 Claims

1. A method for pretreating an organism suspected of being a material of interest in a specimen prior to performing an assay for a determination thereof, which comprises contacting a speciment suspected of containing an organism in an aqueous medium with a composition comprising (a) an enzyme capable of hydrolyzing bonds between N-acetylglucosamine an N-acetylmuramic acid and (b) a chelating agent for magnesium, in an amount and under conditions sufficient to produce a homogeneous suspension of the organism in the aqueous medium but insufficient to produce lysed cells or spheroplasts.

4,617,265

COLONY BLOT ASSAY FOR ENTEROTOXIGENIC BACTERIA

Johnny W. Peterson, Dickinson, Tex., assignor to Board of Regents, University of Texas System, Austin, Tex.

Filed Sep. 19, 1984, Ser. No. 652,369
Int. Cl.[4] C12Q *1/10;* G01N *53/00*
U.S. Cl. 435—38 16 Claims

1. A process for detecting enterotoxigenic *Escherichia coli* which produces a toxin having cross-reactivity with antibody for *Vibrio cholerae* toxin in a biological sample comprising:

obtaining a biological sample;

inoculating a sterile plate comprising nutrient medium and agar with a portion of said biological sample;

incubating the inoculated plate to facilitate growth of bacterial colonies thereupon;

overlaying the bacterial colony-containing plate with a soft agar layer comprising bacterial lysing agents to produce overlaid lysed bacterial colonies;

contacting the soft agar layer with a removable sheet comprising a bound first animal antibody for cholera toxin;

removing and washing said sheet;

exposing said washed sheet to a second animal antibody for cholera toxin;

washing said exposed sheet

treating said washed exposed sheet with a third animal antibody against the second animal antibody, said third animal antibody being coupled to an enzyme capable of generating a chromophoric product;

washing said treated sheet; and

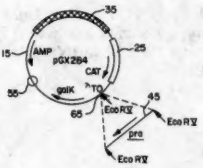
developing the sheet by immersion with a substrate for the bound enzyme to produce chromophoric product.

4,617,266

PRODUCTION OF PROTEIN A

Stephen R. Fahnestock, Brookeville, Md., assignor to Genex Corporation, Gaithersburg, Md.

Filed Apr. 28, 1983, Ser. No. 489,326
Int. Cl.[4] C12P *21/00;* C12N *15/00, 1/20, 1/00*
U.S. Cl. 435—68 12 Claims



1. A plasmid vector comprising a DNA sequence specifying Protein A; expression signals operably linked to said DNA sequence for directing expression of the Protein A DNA sequence in a Gram-positive microorganism of the species "*B. subtilis*"; a selectable phenotypic marker which is expressable in a Gram-positive microorganism of the species "*B. subtilis*"; and a region of sequence homology with a chromosome of a Gram-positive microorganism of the species "*B. substilis*", said region of sequence homology being capable of permitting integration of the Protein A DNA sequence into said chromosome.

4,617,267

PLASMID PCG1 FROM *CORYNEBACTERIUM GLUTAMICUM*

Ryoichi Katsumata, Machida, and Akira Furuya, Kawasaki, both of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 346,867, Feb. 8, 1982, abandoned. This application Jan. 25, 1984, Ser. No. 573,591
Claims priority, application Japan, Feb. 12, 1981, 56-18101
Int. Cl.[4] C12P *19/34;* C12N *1/20, 1/00, 15/00*
U.S. Cl. 435—91 6 Claims

1. An isolated plasmid pCG1 characterized by a molecular weight of about 2 megadaltons and the following cleavage sites for restriction endonucleases:

Restriction enzyme	Number of cleavage sites
EcoRI	1
HindIII	2
HincII	2
BamHI	0
PstI	0
SalI	0
KpnI	0

4,617,268

PROCESS FOR THE PREPARATION OF ADENOSINE-5'-TRIPHOSPHATE BY FERMENTATION

Masayoshi Hatanaka, and Daizo Takeuchi, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 226,913, Jan. 21, 1981, abandoned. This application Nov. 14, 1983, Ser. No. 551,498
Int. Cl.[4] C12P *19/32;* C12N *1/32*
U.S. Cl. 435—92 10 Claims

1. A process for making adenosine-5'-triphosphate comprising the steps of cultivating an adenosine-5'-triphosphate-producing bacterium selected from the group consisting of *Methylomonas methylovora, Pseudomonas insueta, Pseudomonas methanolica, Pseudomonas methanica, Protoaminobacter ruber, Protoaminobacter candidas, Achromobacter methanolophila* and *Bacillus cereus* in a culture medium free of added adenine and of any compound containing an adenine moiety containing as a substrate a substance selected from the group consisting of methanol, methane, methylamine, formaldehyde and formic acid, and an inorganic phosphate in an amount so that the concentration of phosphate (PO_4) is 4 to 35 g/liter, said substance being contained in said culture medium from the beginning of an throughout the cultivating step, thereby causing said bacterium to produce adenosine-5'-triphosphate, separating the proliferated bacteria from the culture medium and isolating the adenosine-5'triphosphate produced from the culture medium.

4,617,269

PROCESS FOR THE PREPARATION OF FRUCTOSYL DISACCHARIDES

Elner B. Rathbone, Wokingham; Andrew J. Hacking, and Peter S. J. Cheetham, both of Reading, all of England, assignors to Tate & Lyle Public Limited Company, England

Filed Jun. 21, 1984, Ser. No. 622,853
Claims priority, application United Kingdom, Jun. 21, 1983, 8316790
Int. Cl.[4] C12P *19/18;* C12N *9/10;* C12R *1/125*
U.S. Cl. 435—97 17 Claims

7. An enzyme isolated from bacteria, which enzyme hydrolizes a donor fructosyl oligosaccharide or disaccharide containing an unsubstituted β-fructosyl ring attached to the anomeric carbon atom of an aldose by a (1→2) linkage and transfers the fructosyl moiety so released to an acceptor aldose to yield a fructosyl disaccharide as the main product, said enzyme being capable of forming 6-substituted sucrose derivatives as the

main product when the acceptor aldose is a 6-substituted glucose, said enzyme producing no significant amounts of alcohol precipitatable oligo- or polyfructoses in the absence of an aldose acceptor, said enzyme having a Km for sucrose of at least 0.1M in the absence of an aldose acceptor and being free from invertase activity, said enzyme being unaffected by the presence of surfactants, having an optimum activity at about 30° C. and being active for at least 20 minutes at up to 45° C.

4,617,270

ALCOHOL AND DISTILLERS GRAIN RECOVERY PROCESS

Clyde G. Anderson, 426 9th Dr., and Tomas E. Vara, P.O. Box 3128, both of Vero Beach, Fla. 32960

Filed May 13, 1983, Ser. No. 494,401
Int. Cl.[4] C12P *7/06;* C12C *11/00*
U.S. Cl. 435—161 28 Claims

1. A process for producing an alcohol from a naturally occurring organic material comprising the steps of:

(a) forming a mixture of said organic material and hot water to form a mash thereof;

(b) steam cooking said mash in the presence of an enzyme to form an effluent of an aqueous liquor including starch and spent insoluble mash;

(c) flash cooling said effluent at a first pressure to form flash steam;

(d) increasing the pressure of said flash steam to form a higher pressure steam;

(e) saccharifying said effluent in the presence of an enzyme to convert said starch to a sugar;

(f) fermenting said effluent to form a vapor including carbon dioxide and an alcohol liquor including alcohol and water;

(g) separating the aqueous liquor containing said alcohol from said insoluble spent mash; and

(h) heat exchanging said higher pressure steam and said separated insoluble mash to at least effect a partial drying thereof.

4,617,271

PROCESS FOR PRODUCING IMMOBILIZED L-ASPARAGINASE PREPARATIONS FOR THE THERAPY OF LEUKEMIA

Masao Nambu, Yokohama, Japan, assignor to Nippon Oil Company, Limited, Tokyo, Japan

PCT No. PCT/JP83/00126, § 371 Date Dec. 16, 1983, § 102(e) Date Dec. 16, 1983, PCT Pub. No. WO83/03763, PCT Pub. Date Nov. 10, 1983
PCT Filed Apr. 21, 1983, Ser. No. 573,922
Claims priority, application Japan, Apr. 21, 1982, 57-65466
Int. Cl.[4] C12N *11/04, 11/02, 11/08, 9/82*
U.S. Cl. 435—182 7 Claims

1. A process for producing immobilized L-asparaginase preparations for the therapy of leukemia which comprises pouring an aqueous solution containing 6% by weight or more of a polyvinyl alcohol with a degree of hydrolysis of 97 mol. % or higher and a degree of polymerization of 1,800 or more and an antileukemic asparaginase into a vessel of a desired shape and subjecting the solution to cooling and solidification at a temperature lower then −15° C., and then partially dehydrating the resulting solidified mass without thawing to a dehydration ratio of 5% by weight or more to obtain a desired gel.

4,617,272

ENZYME DRYING PROCESS

Marda K. Kirkwood, White Bear Lake, and Keith E. Olson, Apple Valley, both of Minn., assignors to Economics Laboratory, Inc., St. Paul, Minn.

Filed Apr. 25, 1984, Ser. No. 603,711
Int. Cl.[4] C12N *9/00*
U.S. Cl. 435—183 14 Claims

1. A process for removing the water from an enzyme-containing aqueous medium comprising:

forming a heated fluidized bed of inert particles by means of a gas stream wherein said fluidized bed is maintained at about 100°–180° F.

contacting said heated inert particles with a spray of an enzyme containing medium, wherein said medium is sprayed at a temperature at about 40°–100° F. resulting in the evaporation of the water and the deposition on said inert particles of a dry powder comprising said enzyme; and

separating said dry enzyme-containing powder from said particles.

4,617,273

ALPHA-ACETOLACTATE DECARBOXYLASE ENZYME AND PREPARATION THEREOF

Frank Olsen, Lyngby, and Knud Aunstrup, Fredensborg, both of Denmark, assignors to Novo Industri A/S, Denmark

Filed Jun. 1, 1984, Ser. No. 616,191
Claims priority, application Denmark, Jun. 3, 1983, 2524/83
Int. Cl.[4] C12N *9/88;* C12R *1/08, 1/10*
U.S. Cl. 435—232 5 Claims

1. An alpha-acetolactate decarboxylase enzyme obtained by cultivation in a suitable nutrient medium of a Bacillus brevis strain or a Bacillus licheniformis strain productive of an alpha-acetolactate decarboxylase characterized by a half-life of at least about 11 days at 10° C. in beer.

4,617,274

BIOCHEMICAL CONVERSIONS BY YEAST FERMENTATION AT HIGH CELL DENSITIES

Eugene H. Wegner, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 316,164, Oct. 29, 1981, Pat. No. 4,414,329, which is a continuation-in-part of Ser. No. 110,457, Jan. 15, 1980, abandoned, which is a continuation-in-part of Ser. No. 29,418, Apr. 12, 1979, abandoned. This application Sep. 22, 1983, Ser. No. 534,848
The portion of the term of this patent subsequent to Nov. 8, 2000, has been disclaimed.
Int. Cl.[4] C12N *1/16, 1/32, 1/26, 1/28, 1/30, 1/14;* C12P *21/00;* C12R *1/84*
U.S. Cl. 435—255 2 Claims

1. A biologically pure yeast culture strain *Pichia pastoris* NRRL Y-11430.

4,617,275

REAGENT FOR BLOOD ANALYSIS

Noriaki Matsuda, Kakogawa, and Etsuro Shinkai, Akashi, both of Japan, assignors to Toa Medical Electronics Co., Ltd., Kobe, Japan

Filed Sep. 24, 1984, Ser. No. 653,861
Claims priority, application Japan, Sep. 29, 1983, 58-183995
Int. Cl.[4] G01N *33/48*
U.S. Cl. 436—10 4 Claims

1. A reagent for preparing cells for blood analysis comprising, as a lysing reagent for leukocyte count measurement, dodecyltrimethylammonium chloride; citric acid; and at least one member selected from the group consisting of tetradecyl-

trimethylammonium bromide and hexadecyltrimethylammonium chloride.

4,617,276

NOVEL METHOD FOR QUANTITATING STRUCTURAL AND NON-STRUCTURAL CARBOHYDRATES IN FEEDSTUFFS

James E. Nocek, Lafayette, N.Y., assignor to Agway Inc., Dewitt, N.Y.

Division of Ser. No. 694,105, Jan. 23, 1985. This application Sep. 6, 1985, Ser. No. 773,054
Int. Cl.[4] G01N *31/00*
U.S. Cl. 436—20 7 Claims

1. The method of determining the non-structural carbohydrate content of a feedstuff comprising:

(a) weighing first and second, essentially chemically identical samples of said feedstuff;

(b) determining the dry matter content of said first and second samples;

(c) determining by chemical analysis the respective percentages of said first sample dry matter constituted by crude protein, lipid and ash;

(d) separating said second sample into first and second parts, respectively comprising the parts which are soluble and insoluble in neutral detergent solution;

(e) weighing said second part to determine the percentage of said second sample dry matter constituted thereby;

(f) determining by chemical analysis the respective percentages of said second part of said second sample constituted by crude protein, lipid and ash;

(g) subtracting from the percentages of crude protein, lipid and ash determined for said first sample, each of the respective quantities of crude protein, lipid and ash determined for said second part of said second sample, to obtain three difference figures; and

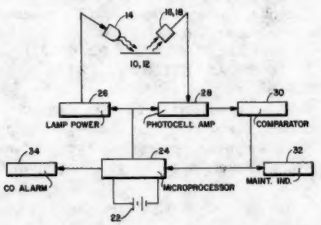
(h) subtracting the sum of said three difference figures from said percentage of dry matter constituted by said second part of said second sample, and subtracting the result from 100, thereby providing a figure representing the percentage of said dry matter constituted by non-structural carbohydrates.

4,617,277

PROCESS AND APPARATUS FOR MONITORING AMBIENT CARBON MONOXIDE

Thomas L. Bohl, Madison, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 23, 1984, Ser. No. 592,510
Int. Cl.[4] G01N *21/78, 31/22*
U.S. Cl. 436—34 11 Claims



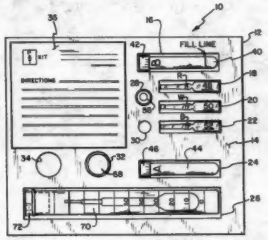
10. A method for intermittently monitoring ambient carbon monoxide comprising the steps of providing a first element which changes color with exposure to carbon monoxide, periodically directing a beam of light against said first element, periodically measuring the intensity of light reflected from said first element, computing the rate of change of said light intensity measurements and varying the periodic measurement of the intensity of light in response to the rate of change of the light intensity measurement.

4,617,278

PETROLEUM ALCOHOL TEST KIT AND METHOD OF TESTING PETROLEUM FOR ALCOHOL CONTENT

Dennis A. Reed, Fort Wayne, Ind., assignor to Bert Keenan, Fort Wayne, Ind.

Filed Oct. 1, 1985, Ser. No. 782,997
Int. Cl.[4] G01N *33/22*
U.S. Cl. 436—60 18 Claims



1. A test kit for on site testing of petroleum for alcohol content comprising:

a calibrated reaction cylinder;

a first tube of ethylene glycol and methyl violet color indicator, a second tube having an opening sealably closable by a lid means, and a first lid means for removably sealing said opening;

a first vial of 20% solution of morpholine in distilled water;

a second vial of 5% solution of sodium nitroprusside in distilled water;

a mixing cup for mixing the contents of said first and second vials to make an indicating fluid;

a second lid means for removably sealing said opening in said second tube, said second lid means including a fluid-absorbent paper or fabric adapted to be impregnated with the indicating fluid;

a third vial of potassium permanganate and sulfuric acid in distilled water; and

a carrier is adapted to receive and carry said first tube, said second tube with the first lid means attached, said first, second and third vials, said mixing cup, said second lid means, and said calibrated reaction cylinder.

14. A method for on site testing of petroleum for alcohol content comprising the steps of:

mixing a first sample of the petroleum with a first colorimetric reagent solution of ethylene glycol and methyl violet dye in a graduated cylinder;

positioning said graduated cylinder in a generally vertical position;

observing the mixed contents of said cylinder for the presence of a colored portion wherein the colored portion is indicative of the presence of ethyl alcohol or methyl alcohol alone or together in the petroleum;

measuring the height of said colored portion to determine the amount of alcohol in the petroleum sample;

mixing a 20% solution of morpholine in distilled water with a 5% solution of sodium nitroprusside in distilled water to form a second reagent colorimetrically and selectively responsive to the pressure of ethyl alcohol and non-responsive to the presence of formaldehyde;

impregnating a fabric with said second colorimetric reagent;

mixing a solution of potassium permanganate and sulfuric acid in distilled water with a second sample of petroleum;

contacting said fabric with vapors emitted by the mixture of said potassium permanganate-sulfuric acid solution and second sample of petroleum; and

observing the color of the colorimetric reagent, a color

change in response to the presence of ethyl alcohol and an absence of color change in response to the absence of ethyl alcohol in said second sample of petroleum.

4,617,279

CALCIUM PHOSPHATE TYPE CRYSTALLIZABLE GLASS

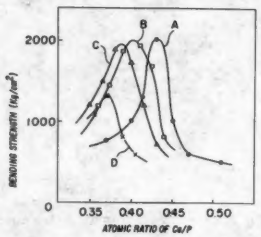
Tsuneo Manabe, Yokohama; Shigeyoshi Kobayashi, Kawasaki, and Hitoshi Kijimuta, Ebina, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Sep. 12, 1985, Ser. No. 775,355

Claims priority, application Japan, Sep. 14, 1984, 59-191437

Int. Cl.[4] C03C *10/02, 3/17*

U.S. Cl. 501—10 3 Claims



1. Calcium phosphate crystallized glass for dental materials consisting essentially of from 41 to 49.5 mol % of CaO, from 50 to 58.5 mol % of P_2O_5 and from 0.5 and 5 mol % of Al_2O_3, and which has an atomic ratio of calcium to phosphorus (Ca/P) of from 0.35 to 0.45.

4,617,280

REFRACTORY LINING AND PROCESS FOR ITS MANUFACTURE

Paul L. Ivarsson, Höganäs; Ingvar G. A. Blom, Nyhamnsläge, and Lars G. Berg, Höganäs, all of Sweden, assignors to Höganäs AB, Höganäs, Sweden

Filed Oct. 9, 1984, Ser. No. 659,002

Int. Cl.[4] C04B *38/02*

U.S. Cl. 501—84 9 Claims

1. A process for the manufacture of a refractory lining comprising foaming a silica-supplying material and a refractory matrix-forming material selected from magnesite and olivine in an aqueous environment to form a fine-blistered foam, and admixing in the resulting mixture a precipitating agent having the ability to provide for precipitation of silica, the silica being then precipitated to form a structure imparting strength and porosity to the material and imparting a volume weight to the material of from about 0.8 to about 1.2 g/cm^3.

4,617,281

CATALYSIS USING SUPPORTED STRONG BASE CATALYSTS

Michael J. Green, Hedon, England, assignor to BP Chemicals Limited, London, England

Filed Jun. 4, 1985, Ser. No. 740,979

Claims priority, application United Kingdom, Jun. 9, 1984, 8414767

Int. Cl.[4] B01J *31/06, 31/02*

U.S. Cl. 502—62 17 Claims

1. A catalyst composition suitable for use in reactions catalysed by a strong base, which catalyst comprises a reaction media insoluble amine or phosphine supported on a reaction media insoluble organic polymer or an inorganic oxide solid, said catalyst having been activated with an alkylene epoxide.

5. A catalyst as claimed in claim 1 characterised in that the inorganic oxide is selected from silica, alumina, a clay, a diatomaceous earth, a zeolite and an aluminosilicate.

4,617,282

MAGNETIZABLE ADSORBENTS

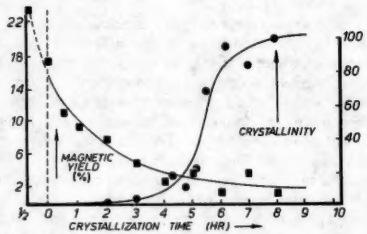
Dominicus J. M. van der Vleugel, Rosmalen; Klaas Hoving, Hellevoetsluis, both of Netherlands; Theodorus M. Wortel, Houston; Ronald E. Rosensweig, Summit, both of Tex., and Lovat V. C. Rees, Chiselhurst, United Kingdom, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 22, 1984, Ser. No. 623,728

Claims priority, application United Kingdom, Jun. 24, 1983, 8317228

Int. Cl.[4] B01J *29/06*

U.S. Cl. 502—66 16 Claims



1. A process for the preparation of magnetizable zeolite composites, in which process discrete magnetizable particles having a maximum particle size of 500 μm are introduced into a reaction mixture for forming the zeolite prior to initiating crystallization by heating the reaction mixture and therefore heating the reaction mixture to the crystallization temperature and that zeolite is formed on the surface of the ferromagnetic particles.

4,617,283

CATALYST FOR CONVERTING SYNTHESIS GAS TO LIQUID MOTOR FUELS

Peter K. Coughlin, Yorktown Heights, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 27, 1984, Ser. No. 625,371

Int. Cl.[4] B01J *29/02, 29/06*

U.S. Cl. 502—66 13 Claims

1. A synthesis gas conversion catalyst composition adapted for the enhanced conversion of synthesis gas comprising carbon monoxide and hydrogen to C+5 hydrocarbon mixtures having enhanced suitability for use as liquid motor fuels comprising:

(a) a Fischer-Tropsch catalyst component comprising cobalt; and

(b) a gold metal component and present in an amount within the range of from about 0.1 to about 50 mole % based on the total amount of cobalt and gold in said composition, whereby the selectivity of cobalt for methane in said synthesis gas conversion is desirably lowered by said gold, increasing the selectivity of said cobalt to desired liquid hydrocarbon fuels.

4,617,284

CATALYST COMPONENT FOR POLYMERIZATION OF OLEFINS AND PROCESS FOR PRODUCTION THEREOF

Mitsuyuki Matsuura, Kameyama; Takashi Fujita, Yokkaichi, and Yoshio Sakamoto, Suzuka, all of Japan, assignors to Mitsubishi Petrochemical Company, Limited, Tokyo, Japan

Filed May 28, 1985, Ser. No. 738,190

Claims priority, application Japan, Jun. 4, 1984, 59-114184; Jul. 12, 1984, 59-143306

Int. Cl.[4] C08F *4/64*

U.S. Cl. 502—111 18 Claims

6. A process for the preparation of a catalyst component for polymerization of olefins, which comprises contacting (A) a powdery halide of magnesium with (B) an alkoxy group-containing compound of a metal selected from metals of Groups I through IV of the Periodic Table to form a particulate solid contact reaction product, adding (C) an organic hydroxy compound selected from the group consisting of alkanols, silanols and phenols, in the form of fine droplets to the particulate solid contact reaction product for one second to five minutes to that only the surface of the solid product is treated with the organic hydroxy compound whereby the particles which remain substantially as they are adhere to each other at their surfaces into particles of a larger particle size to carry out a contact treatment, and contacting the resulting contact reaction product with (D) a liquid titanium halide to obtain a catalyst component in particulate form of an average particle size of 10 to 100 microns.

4,617,285

CATALYST COMPONENTS AND CATALYSTS FOR THE POLYMERIZATION OF OLEFINS

Enrico Albizzati, Arona, Italy, assignor to Montedison S.p.A., Milan, Italy

Filed Mar. 19, 1985, Ser. No. 713,600

Claims priority, application Italy, Mar. 20, 1984, 20138 A/84

Int. Cl.[4] C08F *4/64*

U.S. Cl. 502—134 6 Claims

1. A catalyst component for the polymerization of olefins comprising a tetravalent Ti compound containing at least a halogen-Ti bond, supported on a Ti trichloride or Ti tribromide having an actual surface area of at least 50 m^2/g, said Ti trichloride or Ti tribromide being obtained by reduction of $TiCl_4$ or $TiBr_4$ with a reducing agent other than Al or Al organic compounds.

2. A catalyst component according to claim 1, further comprising a Ti compound containing at least a halogen-Ti bond supported on a Mg dihalide the crystallites of which have a size below 300 Å.

4,617,286

CATALYST FOR POLYURETHANE HAVING DELAY PROPERTY

Shoji Arai; Yutaka Tamano, and Yukihiro Tsutsumi, all of Yamaguchi, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Filed Sep. 5, 1984, Ser. No. 647,399

Claims priority, application Japan, Sep. 8, 1983, 58-164187

Int. Cl.[4] C08G *18/14, 18/18;* B01J *31/04*

U.S. Cl. 502—167 10 Claims

1. A catalyst for the foaming of polyurethanes, comprising: the combination of an organic carboxylic acid salt of a teritiary amine compound and 1-methyl-4-(2-dimethylaminoethyl)piperazine in 5–70% by weight of an organic solvent, wherein the amount of said 1-methyl-4-(2-dimethylaminoethyl)piperazine compound ranges from 0.01 to 10.0 times the molar amount of the tertiary amine component of said organic carboxylic acid salt.

2. The catalyst of claim 1, wherein said tertiary amine compound is selected from the group consisting of triethylenediamine, bis(2-dimethylaminoethyl)ether, dimethylcyclohexylamine, N,N,N',N'-tetramethylhexamethylenediamine, N,N,N',N'',N''-pentamethyldiethylenetriamine and N,N,N',N'',N''-pentamethyldipropylenetriamine.

3. The catalyst of claim 2, wherein said tertiary amine compound is triethylenediamine, bis(2-dimethylaminoethyl)ether or N,N,N',N'',N''-pentamethyldiethylenetriamine.

4,617,287

RUTHENIUM-COBALT CARBONYL CATALYSTS FOR THE DEALKOXYHYDROXYMETHYLATION OF ALDEHYDE ACETALS TO FORM GLYCOL ETHERS

James E. Lyons, Wallingford, Pa., assignor to Sun Refining and Marketing Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 622,815, Jun. 21, 1984, abandoned. This application Oct. 2, 1985, Ser. No. 782,806

Int. Cl.[4] B01J *27/20, 31/20;* C07C *41/01*

U.S. Cl. 502—174 6 Claims

1. A catalyst composition prepared by precipitating a ruthenium and cobalt carbonyl complex from a reaction mixture formed by the dealkoxyhydroxymethylation of an aldehyde acetal with syngas in the presence of a catalyst comprising a mixture of $Co_2(CO)_8$ and $Ru_3(CO)_{12}$, after recovering the reaction product and allowing the remaining liquid medium to stand for a time sufficient to precipitate said catalyst complex having IR bands at 4.83μ, 4.92μ, and 4.98μ.

3. A catalyst composition prepared by precipitating a ruthenium and cobalt carbonyl complex from a reaction mixture formed by the dealkoxylhydroxymethylation of an aldehyde acetal with syngas in the presence of an inert organic solvent and a catalyst comprising a mixture of $Co_2(CO)_8$ and $Ru_3(CO)_{12}$, after recovering the reaction product and allowing the remaining liquid medium to stand for a time sufficient to precipitate said catalyst complex having IR bands at 4.83μ, 4.92μ, and 4.98μ or 4.83μ, 4.92μ, and 4.97μ.

5. A catalyst composition prepared by precipitating a ruthenium and cobalt carbonyl complex from a reaction mixture formed by the treatment of a mixture of $Co_2(CO)_8$ and $Ru_3(CO)_{12}$ in a chlorinated aromatic hydrocarbon with syngas at elevated temperature and pressure and allowing the reaction mixture to stand for a time sufficient to precipitate said catalyst complex having IR bands at 4.83μ, 4.92μ, and 4.98μ.

4,617,288

LOW NITROGEN IRON-CONTAINING FISCHER-TROPSCH CATALYST FOR CONVERSION OF SYNTHESIS GAS AND PROCESS FOR PREPARING THE CATALYST

Weldon K. Bell, Pennington; Werner O. Haag, Lawrenceville; Garry W. Kirker, Sewell, and Donald J. Klocke, Somerdale, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 31, 1984, Ser. No. 687,695

Int. Cl.[4] B01J *23/72, 23/80, 23/85, 23/89*

U.S. Cl. 502—331 16 Claims

1. In a process for preparing an iron-containing Fischer-Tropsch catalyst by continuously precipitating an aqueous solution containing iron nitrate with aqueous amonia, to form a precipitate-containing product which is thereafter dried, the improvement whereby a catalyst containing less than 500 ppm nitrogen is produced which comprises maintaining a pH of about 6.5 to 6.9 and a temperature of about 70° to 100° C. during precipitation.

4,617,289

CATALYST FOR PURIFYING DIESEL ENGINE EXHAUST GASES

Koichi Saito, Osaka; Kenji Ueda, Osaka; Yasuo Ikeda, Himeji, and Tetsuji Ono, Amagasaki, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Aug. 6, 1985, Ser. No. 762,840

Claims priority, application Japan, Aug. 8, 1984, 59-164808; Sep. 7, 1984, 59-186578

Int. Cl.[4] B01J *23/64*

U.S. Cl. 502—339 **6 Claims**

1. A catalyst for purifying a diesel engine exhaust gas, said catalyst comprising a refractory three-dimensional structure having a gas filter function, a porous inorganic carrier supported on it, and (a) vanadium oxide and (b) at least one metal selected from the group consisting of platinum, rhodium and palladium supported on the carrier, the amount of component (a) being in the range of 0.2 to 40.0 g as V_2O_5 per liter of said structure and the amount of component (b) being in the range of 0.1 to 4.0 g as metal per liter of said structure, wherein the mole ratio of component (a) to component (b) deposited as 1–90:1.

4,617,290

SYNERGISTINE DERIVATIVES, THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Jean-Pierre Corbet, Ecully; Claude Cotrel, Paris; Daniel Farge, Thiais, and Jean-Marc Paris, Vaires sur Marne, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

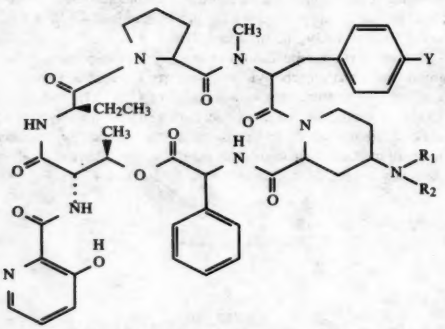
Filed Jul. 12, 1984, Ser. No. 630,245

Claims priority, application France, Jul. 13, 1983, 83 11704

Int. Cl.[4] A61K *37/02*; C07K *5/12*

U.S. Cl. 514—11 **11 Claims**

1. A synergistine of the formula:



in which Y is hydrogen or dimethylamino; and

(I) R_1 is hydrogen and R_2 is

(i) hydroxyl,

(ii) alkyl,

(iii) alkyl substituted by carboxyl, alkoxycarbonyl, hydroxyl, alkylamino, dialkylamino, or dialkylamino in which the alkyls form, with the nitrogen atom to which they are attached, a 4-membered to 7-membered heterocycle chosen from azetidinyl, pyrrolidinyl, piperidinyl, piperazinyl, N-alkylpiperazinyl and azepinyl, (iv) cycloalkyl of 3 to 7 carbon atoms, or (v) a saturated 4-membered to 7-membered heterocycle chosen from azetidinyl, pyrrolidinyl, piperidinyl and azepinyl, these heterocycles being unsubstituted or substituted on the nitrogen atom by alkyl; or

(II) R_1 is formyl or alkylcarbonyl and R_2 is

(i) alkyl substituted by carboxyl,

(ii) alkylamino,

(iii) dialkylamino,

(iv) dialkylamino in which the alkyls form, with the nitrogen atom to which they are attached, a 4-membered to 7-membered heterocycle chosen from azetidinyl, pyrrolidinyl, piperidinyl, piperazinyl, N-alkylpiperazinyl and azepinyl, or

(v) a saturated 4-membered to 7-membered heterocycle chosen from azetidinyl, pyrrolidinyl, piperidinyl and azepinyl, these heterocycles being unsubstituted or substituted on the nitrogen atom by alkyl; or

(III) R_1 and R_2, which are identical or different, are each alkyl which is unsubstituted or substituted by carboxyl, alkoxycarbonyl, hydroxyl, alkylamino, dialkylamino, or dialkylamino in which the alkyls form, with the nitrogen atom to which they are attached, a 4-membered to 7-membered heterocycle chosen from azetidinyl, pyrrolidinyl, piperidinyl, piperazinyl, N-alkylpiperazinyl and azepinyl, or

(IV) R_1 and R_2 together form, with the nitrogen atom to which they are bonded, a 4-membered to 7-membered heterocycle chosen from azetidinyl, pyrrolidinyl, piperidinyl, morpholinyl, piperazinyl, and piperazinyl substituted by alkyl; all the aforesaid alkyl radicals and alkyl portions of radicals containing 1 to 5 carbon atoms each in a linear or branched chain; and its pharmaceutically acceptable salts.

4,617,291

ANGIOTENSIN-CONVERTING ENZYME INHIBITING DIPEPTIDE DERIVATIVES

Tellis A. Martin, and Terence M. Dolak, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

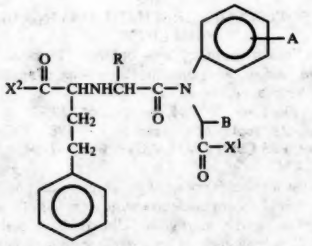
Filed May 14, 1982, Ser. No. 378,295

Int. Cl.[4] A61K *37/43*; C07K *5/06*; C07C *101/44*

U.S. Cl. 514—19 **5 Claims**

1. A compound having formula I

I



and the non-toxic pharmaceutically acceptable salts thereof wherein

A is hydrogen;

B is hydrogen or lower alkyl;

R is hydrogen, lower aikyl, or phenyl-lower alkyl; and

X^1 and X^2 are independently selected from hydroxy or lower (C_1–C_4) alkoxy groups.

4,617,292
PHARMACEUTICAL COMPOSITIONS AND METHOD FOR INHIBITING HISTAMINE RELEASE TOCOPHERYL GLYCOSIDE

Toshio Satoh; Hideki Miyataka, both of Tokushima; Yukimitsu Masamoto, Shiga; Takashi Asai, Takatsuki; Kenji Hasegawa, Ibaraki, and Hisao Kakegawa, Tokushima, all of Japan, assignors to Sunstar Kabushiki Kaisha, Osaka, Japan

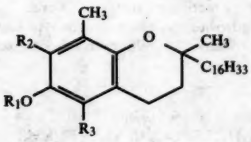
Filed Jul. 17, 1985, Ser. No. 755,777

Claims priority, application Japan, Jul. 21, 1984, 59-151895

Int. Cl.[4] A61K *31/70;* **C07H** *15/26*

U.S. Cl. 514—27 **25 Claims**

1. A method for inhibiting histamine release which comprises orally or patenterally administering or topically applying an effective amount of a compound of the formula:



[I]

wherein R_1 is a residue of a sugar selected from the group consisting of glucose, galactose, cellobiose, mannose, maltose and lactose; R_2 and R_3 are the same or different and each is hydrogen or methyl, to an animal subject requiring said activity including human being.

4,617,293
FLAVONOID PHOSPHATE SALTS OF AMINOGLYCOSIDE ANTIBIOTICS

Helmut Wahlig, Darmstadt; Elvira Dingeldein, Dreieich; Richard Kirchlechner, Rott a. Inn; Dieter Orth, Darmstadt, and Werner Rogalski, Alsbach, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschraenkter Haftung, Darmstadt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 377,779, May 13, 1982, abandoned. This application May 23, 1984, Ser. No. 613,131

Claims priority, application Fed. Rep. of Germany, May 13, 1981, 3118856; Feb. 25, 1982, 3206725

Int. Cl.[4] A61K *31/71;* **C07H** *15/22*

U.S. Cl. 514—41 **12 Claims**

1. A flavonoid phosphate of an aminoglycoside antibiotic, or a mixture thereof.

11. A method of achieving an antibiotic effect in a patient comprising administering an antibiotically effective amount of a compound of claim 1 to the patient.

4,617,294
ANIMAL FEED SUPPLEMENT

Thomas G. Krivak, Akron, Ohio; Stanley A. Heimburger, Pittsburgh, Pa., and James T. Dew, Sulphur, La., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 22, 1985, Ser. No. 725,444

Int. Cl.[4] A61K *9/16, 31/68, 31/455, 31/355*

U.S. Cl. 514—52 **7 Claims**

1. An animal feed supplement consisting essentially of free flowing, substantially dust-free, granular amorphous precipitated silica having at least one vitamin selected from the group consisting of Vitamins A, B_{12}, D, E, and niacin absorbed thereon in amounts of from about 0.02 to about 50 weight percent of vitamin, basis the amorphous precipitated silica, which amounts provide a nutritionally effective amount of said vitamin(s) when blended with animal feed, said precipitated silica having a density of at least 14 pounds per cubic foot, a principal particle size of between about 0.14 millimeters and about 0.84 millimeters, a surface area of from about 140 to 160 square meters per gram and an oil absorption of from about 160 to 220 milliliters per 100 grams, said precipitated silica yielding within the digestive tract of the animal ingesting the animal feed a nutritionally effective amount of vitamin(s) absorbed on said silica.

4,617,295
PESTICIDAL OXIME N-ALKYL-N-α-(ALKYLTHIO-PHOSPHOROTHIO)ACYL CARBAMATES

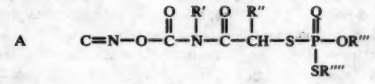
Themistocles D. J. D'Silva, Chapel Hill, N.C., assignor to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 509,451, Jun. 30, 1983, Pat. No. 4,568,671. This application Oct. 3, 1985, Ser. No. 783,534

Int. Cl.[4] A01N *57/02;* **C07F** *9/165, 9/65*

U.S. Cl. 514—97 **10 Claims**

1. The compound represented by the structural formula:



Q is sulfur or oxygen;

R′ is C_{1-4} alkyl;

R″ is hydrogen or C_{1-4} alkyl;

R‴ and R⁗ are individually C_{1-4} alkyl; and

A is a saturated or unsaturated, four or five membered divalent chain composed of carbon atoms and one or two atoms selected from the group comprised of oxygen, sulfur and nitrogen atoms, wherein the carbon and nitrogen atoms of said chain may be substituted with alkyl groups having not more than four carbon atoms.

9. A method for controlling insects or mites comprised of subjecting them to a pesticidally effective amount of the compound of claim 1.

4,617,296
3-O-ACYLATED DERIVATIVES OF (+)-CYANIDAN-3-OL

Alban Albert, Avully; Pierre Courbat, Nyon, and André Weith, Prangins, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

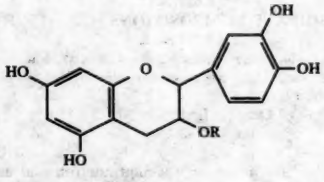
Continuation of Ser. No. 422,110, Sep. 23, 1982, abandoned, which is a division of Ser. No. 182,169, Aug. 28, 1980, abandoned, which is a division of Ser. No. 962,743, Nov. 21, 1978, Pat. No. 4,255,336. This application Jul. 2, 1984, Ser. No. 626,823

Claims priority, application Switzerland, Nov. 25, 1977, 14479/77; Mar. 17, 1978, 2937/78

Int. Cl.[4] A61K *31/35;* **C07D** *311/62*

U.S. Cl. 514—100 **19 Claims**

1. An O-substituted derivative of (+)-cyanidan-3-ol of the formula I



(I)

in which R represents

an acyl radical of an alkanecarboxylic acid containing from 4 to 18 carbon atoms which is unsubstituted or substituted by one or more hydroxy, carboxy, (C_{1-5} alkoxy)carbonyl, C_{1-5} alkanoyl, amino, mono- or di(C_{1-4} alkyl)amino, chloro or fluoro;

cycloalkanecarboxylic acid having 3 to 6 ring carbon atoms which is unsubstituted or substituted by one, two or three, hydroxy, carboxy, C_{1-4} alkoxycarbonyl, amino, mono- or di-(C_{1-4} alkyl)amino, chloro or fluoro;

cycloalkanealkanoic acid, the aliphatic chain thereof having 2 to 4 carbon atoms and the ring having 5 to 6 carbon atom;

phenylalkanoic acid of which the aliphatic chain contains 1 to 4 carbon atoms and of which the phenyl nucleus is unsubstituted or substituted by one or two hydroxy, C_1–C_4 alkoxy, amino, carboxy, (C_1–C_4 alkoxy)carbonyl, C_1–C_4 alkanoyl, C_1–C_4 alkanoyloxy, chloro or fluoro;

nicotinic or isonicotinic acid;

(C_1–C_4 alkoxy)carbonyl;

(C_{1-4} alkyl)sulphonic acid, or phenylsulphonic acid unsubstituted or substituted by one or more C_{1-4} alkyl, C_{1-4} alkoxy or halo; carbamoyl which is unsubstituted or mono- or di-substituted by C_1–C_4 alkyl, or phenyl groups unsubstituted or substituted by hydroxy, methoxy, ethoxy, chloro or fluoro; or a phosphoric acid which is unsubstituted or substituted by dimethyl, diethyl, or monohydroxyphenyl; and pharmaceutically acceptable salts thereof.

3. A method for the prevention of hepatic necrosis, inhibition of lipoperoxidation and inhibition of collagen degradation which comprises administering to an animal an effective hepatic preventive, or liperoxidation or collagen degradation inhibitory, amount of a compound of claim 1.

4,617,297
METHOD OF TREATING DISEASE STATES BY THE ADMINISTRATION OF 1α,25,26-TRIHYDROXYCHOLECALCIFEROL

Alfred Boris, Parsippany; John J. Partridge, and Milan R. Uskokovic, both of Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 458,224, Jan. 14, 1983, abandoned, which is a continuation-in-part of Ser. No. 348,389, Feb. 12, 1982, abandoned. This application Apr. 3, 1984, Ser. No. 596,325

Int. Cl.⁴ A01N *45/00*; A61K *31/59*

U.S. Cl. 514—167 **12 Claims**

1. A method for the treatment of disease states characterized by higher than normal serum levels of endogenously produced 1α,25 dihydroxycholecalciferol which

comprises administering to a host suffering from said disease states an effective amount of the C-25 R or S epimer of 1α,25, 26 trihydroxycholecalciferol.

4,617,298
METHOD AND COMPOSITIONS FOR WEIGHT CONTROL

Nicholas S. Bodor; Kerry S. Estes, and James W. Simpkins, all of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Filed Oct. 22, 1985, Ser. No. 790,159

Int. Cl.⁴ A61K *31/58*

U.S. Cl. 514—176 **27 Claims**

1. A method for mammalian weight control, said method comprising administering to a mammal in need of such treatment, an amount effective to reduce or maintain said mammal's weight of a compound of the formula

[E—DHC] (I)

or a non-toxic pharmaceutically acceptable salt thereof, wherein [E] is an estrogen and [DHC] is the reduced, biooxidizable, blood-brain barrier penetrating, lipoidal form of a dihydropyridine⇄pyridinium salt redox carrier.

4,617,299
METHOD FOR THE PREVENTION OF OCULAR HYPERTENSION, TREATMENT OF GLAUCOMA AND TREATMENT OF OCULAR HYPERTENSION

Paul A. Knepper, 175 E. Delaware St., Chicago, Ill. 60611

Continuation-in-part of Ser. No. 562,843, Dec. 19, 1983, abandoned. This application Oct. 22, 1984, Ser. No. 663,507

Int. Cl.⁴ A61K *31/56, 31/35*

U.S. Cl. 514—178 **28 Claims**

1. A method for reducing elevated intraocular pressure in an eye of a warm blooded animal that comprises contacting the eye repeatedly with a composition containing as an active ingredient an anabolic androgenic compound which is a member of the group consisting of 17-alpha-ethyl-19-nortestosterone, 17-hydroxy-7,17-dimethylandrost-4-en-3-one, 17-beta-hydroxy-16-methandrost-1,4-dien-3-one, 17-hydroxy-2-(hydroxymethylene)-17-methylandrosterone-3-one, dihydrotestosterone, and androsterone, and providing to the eye about 0.001 milligrams to about 10 milligrams of said compound per application.

4,617,300
2(N-HETEROCYCLYL) PENEMS

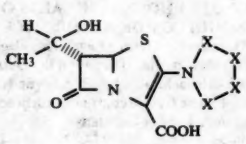
Viyyoor M. Girijavallabhan, Parsippany; Ashit K. Ganguly, Upper Montclair; Naginbhai Patel, Kearny, and Yi-Tsung Liu, Parsippany, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Sep. 21, 1984, Ser. No. 652,707

Int. Cl.⁴ C07D *499/00*; A61K *31/425*

U.S. Cl. 514—192 **34 Claims**

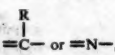
1. Compounds represented by the formula



I

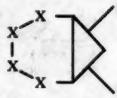
and pharmaceutically acceptable salts and pharmaceutically acceptable esters thereof in racemic or optically active form, wherein

each X independently is



with the proviso that at least one X is

each R is independently selected from hydrogen, lower alkyl, hydroxy, amino lower alkyl, mono- and di-lower alkyl amino lower alkyl, hydroxy lower alkyl, carbamoyloxy lower alkyl, amino, mono- and di-lower alkyl amino, carboxy lower alkyl, carbamoyl lower alkyl, mono-and di-lower alkyl carbamoyl lower alkyl, cyano lower alkyl, halo lower alkyl, carboxy, cyano, hydroxyiminomethyl, sulfo lower alkyl, lower alkoxyiminomethyl, lower alkoxy, 1-(N,N-mono- or di-lower alkyl) hydrazino-2-ylidenyl methyl, carbamoyl amino, mono- and di-lower alkyl carbamoyl amino lower alkanoyloxy, carbamoyloxy, lower alkanoyl amino, lower alkanoyl amino lower alkyl, N-lower alkyl ureido, lower alkyl sulfonyl amino, sulfonic acid, nitro, and 2 adjacent R groups can be connected to form, fused to the five membered heterocyclic ring, a six membered heterocyclic ring of the formula



wherein X is as defined herein.

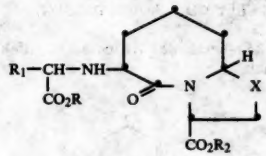
4,617,301

SULFOXIDE AND SULFONE DERIVATIVES OF BICYCLIC LACTAMS AS ANTIHYPERTENSIVES

Arthur A. Patchett, Westfield, and Matthew J. Wyvratt, Jr., Mountainside, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

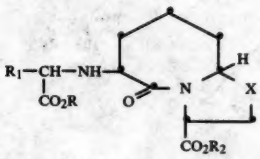
Filed Jun. 22, 1983, Ser. No. 506,925
Int. Cl.[4] A61K *31/55*; C07D *513/04*
U.S. Cl. 514—214 21 Claims

1. A compound of the formula:



wherein:
X is SO or SO_2;
R and R_2 are independently hydrogen, loweralkyl, aryl, and aralkyl;
R_1 is hydrogen;
straight chain and branched alkyl of from 1 to 12 carbon atoms;
C_2–C_{12} straight chain and branched alkenyl and alkylnyl;
cycloalkyl of 3 to 10 carbon atoms;
substituted lower alkyl wherein the substituent can be halo, hydroxy, carboxy, lower alkylthio, lower alkoxy, lower alkoxy carbonyl, lower aralkoxy carbonyl, amino, lower alkylamino, lower dialkylamino, acetylamino or benzoylamino;
substituted lower alkyl having the formula $R_A(CH_2)n$ —Q—$(CH_2)_m$ wherein n is 0–2, m is 1–3, R_A is aryl or heteroaryl optionally substituted by amino, lower dialkylamino, lower alkylamino, hydroxy, loweralkyl, amino lower alkyl, trihaloloweralkyl, cyano, nitro, sulfonamido, benzoyl, 1-naphthoyl, lower alkyl, halo, dihalo, and lower alkoxy, and Q is O, S, N—R_B, $CONR_C$, NR_CCO, CH=CH wherein R_B is hydrogen, lower alkyl, aryl, aralkyl, acetylamino, benzoylamino, benzoyl, or 1-naphthoyl, and R_C is hydrogen or lower alkyl; aryl;
substituted aryl wherein the substituent is lower alkyl, amino loweralkyl, loweralkoxy, aryloxy, benzoyl, 1-naphthoyl, hydroxy, halo, or dihalo; aralkyl or heteroaralkyl which include branched lower alkyl groups; substituted aralkyl or substituted heteroaralkyl which include branched lower alkyl groups wherein the lower alkyl groups can be substituted by amino, acetylamino, benzoylamino, or hydroxyl and the aryl and heteroaryl groups can be substituted by halo, dihalo, loweralkyl, hydroxy, loweralkoxy, aryloxy, benzoyl, 1-naphthoyl, arylthio, amino, amino lower alkyl, lower alkanoyl amino, aroylamino, lower dialkylamino, lower alkylamino, hydroxy, hydroxy loweralkyl, trihalo loweralkyl, nitro, cyano, or sulfonamido; and,
the pharmaceutically acceptable salts thereof wherein in said R, R_1 and R_2 groups, unless otherwise indicated, the aralkyl and heteroalkyl groups have from one to six carbon atoms in the alkyl portion thereof; aryl and the prefix "ar" have 5–6 ring atoms; and, heteroaryl is a member selected from the groups consisting of, indolyl, thienyl, imidazolyl, furyl, benzimidazoyl-yl, pyridyl, quinolinyl, isoquinolinyl, and benzothienyl.

17. A pharmaceutical composition useful in the treatment of hypertension which comprises a pharmaceutically acceptable carrier and a pharmaceutically effective amount of a compound of the formula:



wherein:
X is SO or SO_2;
R and R_2 are independently hydrogen, loweralkyl, aryl, and aralkyl;
I R_1 is hydrogen
straight chain and branched alkyl of from 1 to 12 carbon atoms;
C_2–C_{12} straight chain and branched alkenyl and alkylnyl;
cycloalkyl of 3 to 10 carbon atoms;
substituted lower alkyl wherein the substituent can be halo, hydroxy, carboxy, lower alkylthio, lower alkoxy, lower alkoxy carbonyl, lower aralkoxy carbonyl, amino, lower alkylamino, lower dialkylamino, acetylamino, or benzoylamino;
substituted lower alkyl having the formula $R_A(CH_2)_n$—Q—$(CH_2)_m$ wherein n is 0–2, m is 1–3, R_A is aryl or heteroaryl optionally substituted by amino, lower dialkylamino, lower alkylamino, hydroxy, hydroxy loweralkyl, amino lower alkyl, trihalo loweralkyl, cyano, nitro, sulfonamido, benzoyl, 1-naphthoyl, lower alkyl, halo, dihalo, and lower alkoxy, and Q is O, S, N—R_B, $CONR_C$, NR_CCO, CH=CH whrein R_B is hydrogen, lower alkyl, aryl, aralkyl, acetylamino, benzoylamino, benzoyl, or 1-naphthoyl, and R_C is hydrogen or lower alkyl; aryl;
substituted aryl wherein the substituent is lower alkyl, amino loweralkyl, loweralkoxy, aryloxy, benzoyl, 1-naphthoyl, hydroxy, halo, or dihalo; aralkyl or heteroaralkyl which include branched lower alkyl groups;
substituted aralkyl or substituted heteroaralkyl which include branched lower alkyl groups wherein the lower alkyl groups can be substituted by amino, acetylamino, benzoylamino or hydroxyl and the aryl and heteroaryl groups can be substituted by halo, dihalo, loweralkyl, hydroxy, loweralkoxy, aryloxy, benzoyl, 1-naphthoyl, arylthio, amino, amino lower alkyl, lower alkanoyl amino, aroylamino, lower dialkylamino, lower alkylamino, hydroxy, hydroxy loweralkyl, trihalo loweralkyl, nitro, cyano, or sulfonamido; and,
the pharmaceutically acceptable salts thereof wherein in said R, R_1 and R_2 groups, unless otherwise indicated, the aralkyl and heteroaralkyl groups have from one to six carbon atoms in the alkyl portion thereof; aryl and the prefix "ar" have 5–6 ring atoms; and, heteroaryl is a member selected from the groups consisting of, indolyl, thienyl, imidazolyl, furyl, benizimidazolyl, pyridyl, quinolinyl, isoquinolinyl, and benzothienyl.

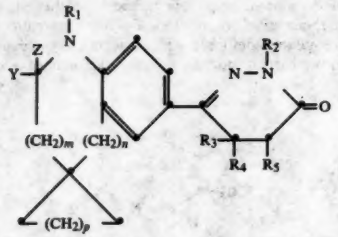
4,617,302

INOTROPIC AGENTS

David W. Robertson, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 15, 1984, Ser. No. 660,836
Int. Cl.[4] C07D *401/10, 403/10*; A61K *31/50, 31/55*
U.S. Cl. 514—254 20 Claims

1. A compound of the formula



I

wherein

Y and Z are each hydrogen, or when taken together are =O;

R_1, R_2, R_3, R_4, and R_5 are independently hydrogen or C_1–C_4 alkyl, or R_5 and one of R_3 and R_4 taken together form a bond;

m and n are independently 0, 1 or 2, provided that (m+n) is no greater than 2; and

p is 0, 1 or 2, and pharmaceutically acceptable acid addition salts thereof.

9. A method of treating a mammal, including a human subject, suffering from or susceptible to heart failure, which comprises administering to said mammal an effective amount of a compound of claim 1.

4,617,303
7-AMINOAZOLO [1,5-a] PYRIMIDINES AND FUNGICIDES CONTAINING THESE

Karl Eicken, Wachenheim; Hermann Graf, Mutterstadt; Walter Gramlich, Edingen-Neckarhausen; Hubert Sauter, Mannheim; Costin Rentzea, Heidelberg; Ernst-Heinrich Pommer, Limburgerhof, and Eberhard Ammermann, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

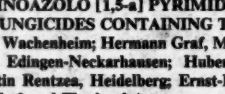
Filed Oct. 19, 1984, Ser. No. 662,592

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1983, 3338292

Int. Cl.[4] C07D *487/04;* A01N *43/90*

U.S. Cl. 514—258 **7 Claims**

1.



I

where

R^1 is a C_6–C_{18}-alkyl which is unsubstituted or a C_3–C_{18} alkyl which is mono substituted by a C_1–C_{18}-alkoxy or halogen and

R^2 and R^3 are each hydrogen or a C_1–C_4-alkyl, and

A is nitrogen or CR^4, where

R^4 is hydrogen, a C_1–C_4 alkyl or halogen.

4,617,304
PURINE DERIVATIVES

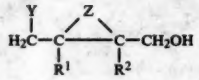
Wallace Ashton, Clark, N.J.; Edward Walton, Sun City West, Ariz., and Richard L. Tolman, Warren, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 10, 1984, Ser. No. 598,612

Int. Cl.[4] C07D *473/18;* A61K *31/52*

U.S. Cl. 514—261 **8 Claims**

1. A compound of the formula



and the pharmaceutically acceptable salts thereof wherein Y is a purin-9-yl or a heterocyclic isostere of a purin-9-yl group; R^1 is selected from hydrogen and alkyl of 1 to 4 carbon atoms; R^2 is selected from hydrogen, alkyl of 1 to 4 carbon atoms, and $-CH_2OH$; and Z is $>CH_2$ or $>O$.

4,617,305
4-ALKYLINDOLONAPHTHYRIDINES AND THEIR THERAPEUTICAL APPLICATION

Jean A. A. J. Hannart, Dion-Valmont, Belgium, assignor to Omnichem, S.A., Belgium

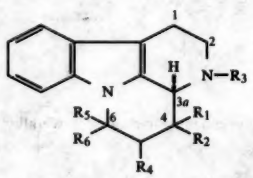
Filed Feb. 22, 1984, Ser. No. 582,314

Claims priority, application Luxembourg, Feb. 25, 1983, 84664

Int. Cl.[4] C07D *471/16;* A61K *31/475*

U.S. Cl. 514—278 **13 Claims**

1. A 2,2,3,3a,4,5,6-hexahydro 1H indolo(3,2,1-de)(1,5)naphtyridine of formula



(I)

in the form of base or acid addition salt, wherein one of the groups R1 and R2 represents a C_{2-3} alkyl group and the other represents a hydrogen atom in the cis configuration relative to the 3a hydrogen or R1 and R2 represent each independently an alkyl group or, together, an alkanediyl group having from 4 to 6 carbon atoms,

R3 represents a lower alkyl group or a hydrogen atom and either

R_5 represents a lower carboalkoxy group or a hydrogen atom and R6 represents with R4 an additional carbon-carbon bond or

R4 represents a hydrogen atom and R6 and R5 represent together an oxygen atom or respectively a hydrogen atom and a hydroxyl group.

4,617,306
PHARMACEUTICAL PREPARATION COMPRISING CO-DERGOCRINE AND A CALCIUM ANTAGONIST

Dieter Welzel, and Hans Bühlmann, both of Nuremberg, Fed. Rep. of Germany, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 723,948, Apr. 16, 1985, abandoned, which is a continuation of Ser. No. 601,496, Apr. 18, 1984, abandoned. This application Sep. 13, 1985, Ser. No. 775,985

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1983, 3314607

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—288 **16 Claims**

1. A method of treating hypertension comprising co-administering to a subject in need of such treatment:

(a) co-dergocrine or a pharmaceutically acceptable acid addition salt thereof; and

(b) as a calcium antagonist, 1,4-dihydro-2,6-dimethyl-4-(2-nitrophenyl)-3,5-pyridine-dicarboxylic acid dimethyl ester;

said components (a) and (b) being co-administered in a ratio of 1:2.5 to 1:25 p.p.w.

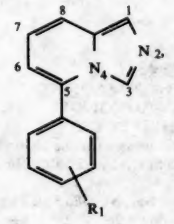
4,617,307

SUBSTITUTED IMIDAZO[1,5-A]PYRIDINE DERIVATIVES AS AROMATASE INHIBITORS

Leslie J. Browne, Morris Plains, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

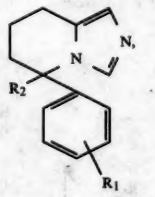
Filed Jun. 20, 1984, Ser. No. 622,421
Int. Cl.[4] A61K *31/44*; C07D *471/04*
U.S. Cl. 514—300 **20 Claims**

1. A compound of the formula



(Ia)

wherein R_1 represents cyano, nitro or C_1–C_4-alkyl, or a 7,8-dihydro derivative thereof, or a 5,6,7,8-tetrahydro compound of the formula



(Ib)

wherein R_1 is cyano, nitro or C_1–C_4 alkyl; and R_2 is hydrogen, C_1–C_4-alkyl, phenyl-C_1–C_4-alkyl, halogen, C_1–C_4-alkoxy, C_1–C_4-alkylthio, phenyl-C_1–C_4-alkylthio, phenylthio, hydroxy or mercapto esterified by C_1–C_4-alkanoyl, carboxy-C_1–C_4-alkyl, C_1–C_4-alkoxycarbonyl-C_1–C_4-alkyl, or C_1–C_4-alkanoyl; or a pharmaceutically acceptable salt thereof.

6. An aromatase inhibiting pharmaceutical composition comprising an effective aromatase inhibiting amount of a compound of claim **1** of the formula Ia or Ib, or a pharmaceutically acceptable salt thereof; together with a pharmaceutically acceptable carrier or a mixture of pharmaceutically acceptable carriers.

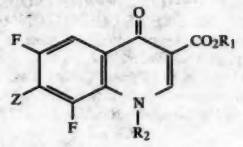
4,617,308

7-SUBSTITUTED AMINO-1-ARYL-6,8-DIFLUORO-1,4-DIHYDRO-4-OXO-3-QUINOLINECARBOXYLIC ACIDS AND DERIVATIVES THEREOF AS ANTIBACTERIAL AGENTS

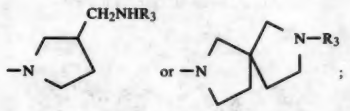
Thomas F. Mich, Ann Arbor, and John M. Domagala, Canton, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jan. 25, 1985, Ser. No. 695,145
Int. Cl.[4] A61K *31/97*; C07D *215/27*
U.S. Cl. 514—312 **12 Claims**

1. A compound of the formula



wherein Z is



wherein Z is

R_1 is hydrogen, alkyl having from one to six carbon atoms or a cation; R_2 is phenyl or phenyl substituted by halogen, alkyl, alkoxy, hydroxy, amino, monoalkylamino, dialkylamino or trifluoromethyl, 2-, 3-, or 4-pyridine, 2- or 3-thiophene, 2-imidazole, 2-oxazole or 2-thiazole; R_3 is hydrogen, alkyl having from one to four carbon atoms or cycloalkyl having three to six carbon atoms; or a pharmaceutically acceptable acid addition or base salt thereof.

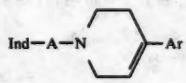
4,617,309

SULFUR-CONTAINING INDOLE DERIVATIVES

Henning Böttcher, Darmstadt; Rudolf Gottschlich, Reinheim; Hans-Heinrich Hausberg, Ober-Ramstadt; Christoph Seyfried, Seeheim-Jugenheim, and Klaus-Otto Minck, Ober-Ramstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Sep. 30, 1983, Ser. No. 537,621
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1982, 3236243
Int. Cl.[4] C07D *401/12*; A61K *31/44*
U.S. Cl. 514—339 **21 Claims**

1. A sulfur-containing indole derivative of the formula



wherein

Ind is 3-indolyl or 3-indolyl substituted once or twice by alkyl, O-alkyl, S-alkyl, SO-alkyl, SO_2-alkyl, OH, F, Cl, Br, CF_3 or CN or by methylenedioxy;

A is $-(CH_2)_n-E-C_mH_{2m}-$ or $-(CH_2)_n-E-C_{m-1}H_{2m-2}CO-$;

n is 0 or 1;

m is 2, 3 or 4;

E is S, SO or SO_2;

and

Ar is phenyl or phenyl substituted once or twice by alkyl, O-alkyl, S-alkyl, SO-alkyl, SO_2-alkyl, OH, F, Cl, Br, CF_3 or CN or by methylenedioxy;

wherein each alkyl group is of 1–4C atoms;

or a physiologically acceptable acid addition salt thereof.

4,617,310

5-OXO-2-PYRROLIDINEPROPANOIC ACID DERIVATIVES AND USE AS COGNITION ACTIVATORS

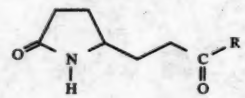
Donald E. Butler, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 476,524, Mar. 24, 1983, Pat. No. 4,559,358, which is a continuation-in-part of Ser. No. 381,662, May 24, 1982, abandoned. This application Aug. 15, 1985, Ser. No. 765,749

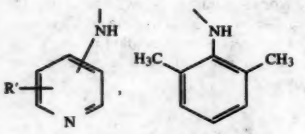
Int. Cl.[4] C07D *401/06, 207/12;* A61K *31/40, 31/44, 31/445*

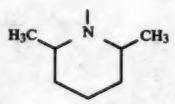
U.S. Cl. 514—343 **6 Claims**

1. A compound having the structural formula



wherein R is selected from





where R' is amino, alkylamino, or dialkylamino of from one to six carbon atoms.

5. A pharmaceutical composition comprising an electroconvulsive shock-induced amnesia reversing effective amount of a compound as defined by claim 1 in combination with a pharmaceutically acceptable carrier.

6. A method for reversing amnesia caused by electroconvulsive shock in a mammal in need of said treatment, which method comprises administering to said mammal the pharmaceutical composition defined in claim 5.

4,617,311

ANTIASTHMATIC METHOD

Peter P. K. Ho, Carmel, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed May 17, 1985, Ser. No. 736,896

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—353 **4 Claims**

1. A method of treating mammals suffering from or susceptible to asthma which comprises administering an effective amount of Pinacidil.

4,617,312

ALDOSE REDUCTASE INHIBITING 5-(2-ALKOXYPHENYL) THIAZOLIDINEDIONES

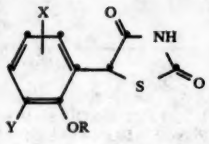
Rodney C. Schnur, Noank, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 458,684, Jan. 17, 1983, abandoned. This application Jan. 17, 1985, Ser. No. 692,252

Int. Cl.[4] C07D *277/34;* A61K *31/425*

U.S. Cl. 514—369 **12 Claims**

1. A compound selected from the group consisting of aryl thiazolidinedione derivatives of the formula:



and the base salts thereof with pharmaceutically acceptable cations, wherein

R is alkyl having from one to four carbon atoms;

X is fluoro, chloro or bromo; and

Y is hydrogen, chloro, lower alkyl or lower alkoxy, provided that when Y is hydrogen then X is not 4-chloro.

4,617,313

ALPHA$_2$-ANTAGONISTIC 2-(4,5-DIHYDRO-1H-IMIDAZOL-2-YL)-PYRROLO[3,2,1-HI]INDOLES

Dennis Bigg, Jouy en Josas; Claude Morel, Magny-les-Hameaux, and Mireille Sevrin, Paris, all of France, assignors to Synthelabo, France

Continuation-in-part of Ser. No. 680,504, Dec. 11, 1984, abandoned. This application Aug. 28, 1985, Ser. No. 770,079

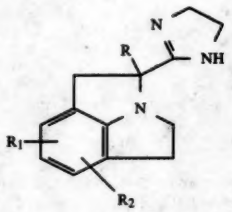
Claims priority, application France, Dec. 12, 1983, 83 19850; Sep. 27, 1984, 84 14839

Int. Cl.[4] A61K *31/415;* C07D *487/06*

U.S. Cl. 514—402 **4 Claims**

1. A pyrrolo-3,2,1-hi]indole derivative, in the form of the racemate or an optically active isomer, of the formula (I)

(I)



in which R is hydrogen or a linear or branched C_{1-4} alkyl group, and R_1 and R_2 which may be the same or different, are hydrogen, halogen or C_{1-4} alkyl, or a pharmaceutically acceptable acid addition salt thereof.

4. A pharmaceutical composition useful as an α_2-antagonist which contains, as active ingredient, an α_2-antagonistically effective amount of a pyrrolo-indole derivative or salt as claimed in claim 1, in association with a pharmaceutically acceptable excipient.

4,617,314

BENZOFURAN- AND BENZOPYRAN-CARBOXAMIDE DERIVATIVES

Tetsuya Tahara, Nakatsu; Kiyoharu Hayano, Fukuoka; Michihide Setoguchi, Nakatsu, and Takemi Fukuda, Fukuoka, all of Japan, assignors to Yoshitomi Pharmaceutical Industries Ltd., Osaka, Japan

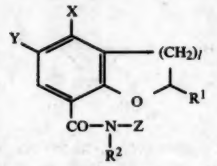
Filed Mar. 20, 1984, Ser. No. 591,363

Claims priority, application Japan, Apr. 8, 1983, 58-62554

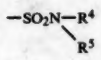
Int. Cl.[4] A61K *31/34, 31/35;* C07D *405/12*

U.S. Cl. 514—422 **11 Claims**

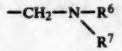
1. Compounds of the formula:



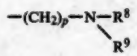
wherein l is 1 or 2; X is hydrogen atom, amino group or halogen atom; Y is $-S(O)_m-R^3$ wherein R^3 is lower alkyl group and m is 0, 1 or 2, or



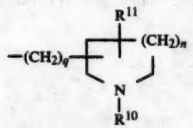
wherein R^4 and R^5 are the same or different and each is hydrogen atom or lower alkyl group; R^1 is hydrogen atom, lower alkyl group, arylthiomethyl group, halogenomethyl group or



wherein R^6 and R^7 are the same or different and each is hydrogen atom or lower alkyl group or R^6 and R^7 form, together with the adjacent nitrogen atom, a heterocycle selected from the group consisting of pyrrolidine, piperidine and morpholine; R^2 is hydrogen atom or lower alkyl group; and Z is



wherein p is 2 or 3, R^8 and R^9 are the same or different and each is lower alkyl group or R^8 and R^9 form, together with the adjacent nitrogen atom, a heterocycle selected from the group consisting of pyrrolidine, piperidine and morpholine, or



wherein q is 0 or 1, n is 1 or 2, R^{10} is lower alkyl group, lower alkenyl group, lower alkynyl group, phenyl(lower)alkyl group or cycloalkyl group and R^{11} is hydrogen atom or lower alkyl group, physiologically acceptable salts thereof or optical isomers thereof.

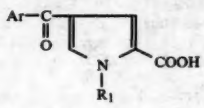
4,617,315

PHARMACEUTICAL COMPOSITIONS HAVING IMMUNO-SUPPRESSIVE PROPERTIES

Pierre Bessin, Chilly Mazarin, and Jacqueline Bonnet, Paris, both of France, assignors to Albert Rolland, S.A., Paris, France

Filed May 24, 1985, Ser. No. 738,043
Int. Cl.[4] A61K *31/40*
U.S. Cl. 514—427 **3 Claims**

1. A method of producing immuno-suppressive action which comprises administering to a subject in need of same a safe and effective amount of the active ingredient of least one compound of formula I



(I)

wherein Ar is a member selected from the group consisting of phenyl, halogenophenyl, naphthyl-1 and naphthyl-2 and R_1 is methyl or phenyl

or the pharmaceutically acceptable mineral or organic base addition salts thereof.

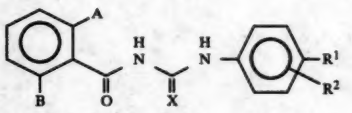
4,617,316

INSECTICIDAL HETEROARYL SUBSTITUTED PHENYL BENZOYLUREAS

Ernest L. Plummer, Yardley, Pa., assignor to FMC Corporation, Philadelphia, Pa.

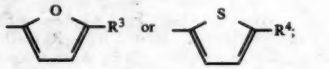
Division of Ser. No. 589,604, Mar. 14, 1984. This application Dec. 20, 1985, Ser. No. 811,208
Int. Cl.[4] A01N *43/08, 43/10*; C07D *307/54, 333/24*
U.S. Cl. 514—438 **3 Claims**

1. A compound of the formula:



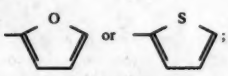
in which:

A. A is chloro, B is hydrogen, X is oxygen, and R^1 is



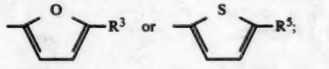
R^2 is in the 3-position and is chloro, cyano, alkyl of 1 or 2 carbon atoms, alkoxy of 1 or 2 carbon atoms, or is in the 3- and 5-positions and at each position is a halogen atom; R^3 is hydrogen or chloro; R^4 is hydrogen or methyl; or

B. A is chloro, B is hydrogen, X is sulfur, and R^1 is



R^2 is cyano, alkyl of 1 or 2 carbon atoms, alkoxy of 1 or 2 carbon atoms, or halomethyl; or

C. A and B are each fluoro, X is oxygen; and R^1 is



R^2 is in the 3-position and is hydrogen, halo, cyano, alkyl of 1 or 2 carbon atoms, alkoxy of 1 to 3 carbon atoms, halomethyl, halomethoxy, or is in the 3- and 5-positions and at each position is a halogen atom; R^3 is as defined above and R^5 is hydrogen, chloro, methyl, or trifluoromethyl.

4,617,317

METHOD OF TREATING ULCERATIVE COLITIS

Justin D. Bennet, 4803 Hart Dr., San Diego, Calif. 92116

Filed Oct. 31, 1984, Ser. No. 666,753
Int. Cl.[4] A61K *31/355*
U.S. Cl. 514—458 **2 Claims**

1. A method of preventing and/or treating ulcerative colitis comprising administering to a patient 1.5–6 grms daily of alpha, beta, gamma or delta tocopherol quinone.

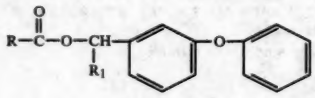
4,617,318

NON-IRRITATING PYRETHROID FORMULATIONS IN VEGETABLE OILS AND TALL OILS

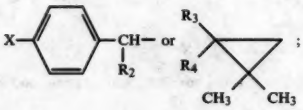
Abdel H. Marei, Mercerville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Sep. 25, 1981, Ser. No. 305,759
Int. Cl.[4] A01N *37/34, 53/00, 37/10*
U.S. Cl. 514—520 **10 Claims**

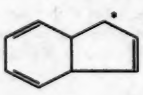
1. A low eye-irritating composition comprising about 5% to 45% by weight of a pesticidal compound of the following structural formula:



wherein R_1 is hydrogen or CN: R is

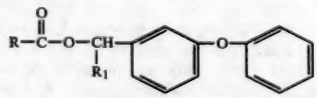


X is Cl, Br, CH_3—, CH_3O—, CF_3—, CF_3O— or F_2CHO; R_2 is C_1–C_4 alkyl; R_3 is H, Cl, Br or CH_3—; R_4 is Cl, Br, CH_3, $(Cl)_2$—C═CH— or $(Br)_2C$═CH—; and when R_3 and R_4 are taken together with the carbon atoms they are attached to, they represent the moiety

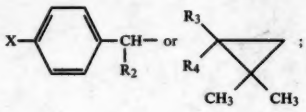


in which the carbon atom marked by an asterick is shared both by the moiety and the cyclopropane ring to which it is attached; and 2% to 10% by weight of the surfactant sorbitan monolaurate, sorbitan monooleate, or mixtures thereof, and a tall oil, in amounts sufficient to total the composition to 100%.

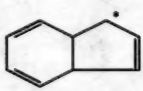
8. A method for the control of insects comprising applying to a locus in which insect control is desired about 0.15 to 37 l/ha, in the form of finely divided microns, of a low eye-irritating composition of about 5% to 45% by weight of a compound having the formula:



wherein R_1 is hydrogen or CN; R is



X is hydrogen, halogen, C_1–C_3 alkyl, C_1–C_3 alkoxy, CF_3, CF_3O— or F_2CHO; R_2 is C_1–C_4 alkyl; R_3 is hydrogen, halogen or C_1–C_2 alkyl; R_4 is halogen, C_1–C_2 alkyl or $(y)_2$═CH— and y is halogen, and when R_3 and R_4 are taken together with the carbon atoms they are attached to, they represent the moiety



in which the carbon atom marked with an asterisk is shared both by said moiety and the cyclopropane ring to which it is attached; 2% to 10% by weight of sorbitan monolaurate, sorbitan monooleate, or mixtures thereof, and 45% to 90% by weight of a tall oil.

4,617,319

METHOD OF TREATING MULTIPLE SCLEROSIS

Suresh S. Kerwar, Ossining; Adolph E. Sloboda, New City, and Susan C. Ridge, Valley Cottage, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 13, 1985, Ser. No. 744,370
Int. Cl.[4] A61U *31/135*
U.S. Cl. 514—647 **8 Claims**

1. A method of treating neuroimmunologic diseases in a mammal which comprises administering parenterally to said mammal from about 0.25 to about 0.5 mg per kilogram of body weight per day of a compound selected from 1,4-dihydroxy-5,8-bis[[2-(2-hydroxethylamino)ethyl]amino]-anthraquinone and the pharmacologically acceptable acid addition salts thereof.

4,617,320

ENHANCED CONVERSION OF SYNGAS TO LIQUID MOTOR FUELS

Peter K. Coughlin, Yorktown Heights, and Jule A. Rabo, Armonk, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 625,373, Jun. 27, 1984, Pat. No. 4,556,645. This application Nov. 18, 1985, Ser. No. 799,022
Int. Cl.[4] C07C *1/04*
U.S. Cl. 518—719 **37 Claims**

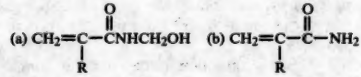
1. A process for the catalytic conversion of synthesis gas comprising carbon monoxide and hydrogen to C_5^+ hydrocarbon mixtures having enhanced suitability for use as liquid motor fuels comprising contacting said synthesis gas with a dual catalyst composition comprising a Fischer-Tropsch catalyst together with a co-catalyst/support component comprising a crystalline, microporous SAPO silicoaluminophosphate, non-zeolitic molecular sieve catalyst, the resulting hydrocarbon product containing more than about 10% of C_5^+ hydrocarbon molecules comprising C_5 up to about C_{22} material, said product having useful quality for liquid motor fuels, whereby synthesis gas can selectively be converted to hydrocarbons boiling in the gasoline and jet fuel and diesel oil boiling range.

4,617,321
SYNTHESIS OF HIGHLY CROSS-LINKED CATION-EXCHANGE POLYMERS FROM AN AQUEOUS SOLUTION

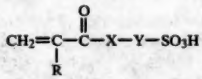
Russell J. MacDonald, Watertown, Mass., assignor to Ionics, Incorporated, Watertown, Mass.

Filed Jul. 2, 1985, Ser. No. 751,710
Int. Cl.[4] C08D 5/20; C08F 212/30
U.S. Cl. 521—38 4 Claims

1. The process for making a cation exchange polymer comprising in a single step, the simultaneous cross-linking and polymerization in the presence of a free radical initiator, a pair of monomers (a) and (b) of the formula:



with an aliphatic sulfonic acid monomer of the formula:



Where R represents CH or H; X represents NH or O and Y represents a straight-chain unit such as ethyl(—CH_2—CH_2—) or a branch-chain alkyl unit such as isobutyl (—$C(CH_3)_2C$-H_2—).

4,617,322
PRE-EXPANDED PARTICLE OF NON-CROSSLINKED LINEAR LOW DENSITY POLYETHYLENE

Kenichi Senda, Hirakata; Masao Ando, Toyonaka; Kyoichi Nakamura, Osaka, and Tatehiko Nishida, Ibaraki, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 584,859, Feb. 29, 1984, Pat. No. 4,540,718. This application Jun. 26, 1985, Ser. No. 748,803
Claims priority, application Japan, Apr. 5, 1983, 58-60591; Jan. 18, 1984, 59-7634
Int. Cl.[4] C08J 9/18
U.S. Cl. 521—60 4 Claims

1. A pre-expanded particle of non-crosslined linear low density ethylene copolymer which is a copolymer of ethylene and an α-olefin of C_4 to C_{20} and has a characteristic property that an inclination of metlt tension is not more than 1,500.

4,617,323
PREFOAMED PARTICLES OF CROSSLINKED PROPYLENE-TYPE RESIN AND MOLDED ARTICLE PREPARED THEREFROM

Hideki Kuwabara, Hadano; Yoshimi Sudo, Chigasaki, and Atusi Kitagawa, Fujisawa, all of Japan, assignors to Japan Styrene Paper Corporation, Tokyo, Japan

Filed Feb. 12, 1985, Ser. No. 700,895
Claims priority, application Japan, Feb. 13, 1984, 59-24607
Int. Cl.[4] C08J 9/22
U.S. Cl. 521—60 4 Claims

1. Prefoamed crosslinked propylene-type resin particles prepared by using as a base resin a propylene random copolymer composed of propylene and another olefin selected from the group consisting of ethylene, butene-1, pentene, hexene, octene and 4-methylpentene-1 and whose amount of heat of crystallization determined by a DSC method is 19 to 10 cal/g, said prefoamed particles having a gel fraction of 25 to 65%, said prefoamed particles also having an internal pressure decreasing speed coefficient, k, at 1 atmosphere which is represented by $k \leqq 0.3$ (1/hr).

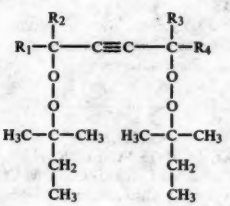
4,617,324
ACETYLENIC DI(T-AMYL PEROXIDE) CROSS-LINKING/BLOWING AGENTS FOR POLYETHYLENE

John R. Muenchow, Richmond; Lawrence A. Bock, Walnut Creek, and Roger N. Lewis, Martinez, all of Calif., assignors to U.S. Peroxygen Company, Richmond, Calif.

Filed Oct. 22, 1985, Ser. No. 790,285
Int. Cl.[4] C08J 9/06
U.S. Cl. 521—96 19 Claims

1. A method for making foamed, cross-linked polyethylene comprising:

mixing polyethylene with about 0.1–10% by weight of a cross-linking/blowing agent of the formula



wherein each of R_1, R_2, R_3, and R_4 is selected from straight and branched alkyl having from 1–4 carbon atoms; and

heating said mixture to a temperature sufficient to cross-link and foam said polyethylene under conditions which permit expansion of the polyethylene.

4,617,325
ORGANIC POLYMERS CONTAINING ANTISTATIC AGENTS COMPRISING THE POLYMER HAVING DISPERSED THEREIN A NON-VOLATILE IONIZABLE METAL SALT AND A PHOSPHATE ESTER

Thomas M. Knobel; Earl E. Kennedy, and Mary A. Walker, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 644,586, Aug. 27, 1984, abandoned. This application Jul. 2, 1985, Ser. No. 751,352
Int. Cl.[4] C08G 18/14
U.S. Cl. 521—105 15 Claims

1. An organic polymer composition comprising an organic polymer having dispersed therein

(a) an alkali metal tetraorganoboride and

(b) an enhancer compound comprising a phosphate ester which is compatible with said organic polymer and in which said alkali metal tetraorganoboride is soluble.

4,617,326
BACTERIA ADSORBING COMPOSITION

Sten G. Björnberg, Spanga; Wilhelm E. S. Hjertén, Upsala, and Torkel M. Wadström, Knivsta, all of Sweden, assignors to Landstingens Inkopscentral Lic Ekonomisk Forening, Solna, Sweden

Filed Mar. 14, 1985, Ser. No. 711,715
Claims priority, application Sweden, Mar. 14, 1984, 8401438
Int. Cl.[4] A61F 15/00
U.S. Cl. 523—111 4 Claims

1. A bacteria adsorbing composition in water-insoluble form which includes a first component comprising one or more liquid permeable layers of a powerfully hydrophobic, bacteria adsorbing, physiologically innocuous material comprising a woven or non-woven hydrophilic fabric, which has been rendered hydrophobic by chemical treatment with a compound containing hydrophobic groups, and a second component comprising one or more layers of a hydrophilic, liquid adsorbing, physiologically innocuous material, at least one layer of

hydrophilic material being located externally of at least part of the hydrophobic material as viewed from the surface to be treated.

4,617,327

INORGANIC-ORGANIC FILLERS FOR POLYMERIZABLE COMPOSITIONS

Wolfgang Podszun, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengeselischaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 671,373, Nov. 14, 1984, abandoned. This application Oct. 10, 1985, Ser. No. 786,256

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1983, 3341888

Int. Cl.[4] C08F *2/44;* **C08K** *9/10, 9/06;* **A61K** *6/08*

U.S. Cl. 523—116 **12 Claims**

1. A filler for a polymerizable composition comprising an inorganic core of particles with a particle size of 10 to 500 nm, a first shell of vinylsilane and a second shell of a (meth)acrylate polymer.

4,617,328

BIOCIDAL AGENTS FOR USE IN PLASTICS, POLYMERS AND CELLULOSIC MATERIALS

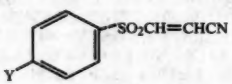
Sophia Y. Liu, Fremont, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 641,622, Aug. 17, 1984, abandoned, which is a continuation of Ser. No. 221,120, Dec. 29, 1980, abandoned. This application Nov. 1, 1985, Ser. No. 793,877

Int. Cl.[4] C08K *5/41*

U.S. Cl. 523—122 **19 Claims**

1. A plastic or film composition other than a paint comprising a polymer and further comprising a microbiocidally effective amount of a compound having the formula



in which Y is hydrogen, halogen or methyl.

4,617,329

PIGMENTED THERMOPLASTIC RESINS

Richard H. Weese, Washington Crossing, Pa.; Evan H. Crook, Cherry Hill, N.J., and Susan M. Liwak, Langhorne, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 594,161, Mar. 30, 1984, abandoned, which is a continuation-in-part of Ser. No. 513,741, Jul. 22, 1983, abandoned. This application Sep. 5, 1985, Ser. No. 762,236

Int. Cl.[4] C08L *67/02, 69/00*

U.S. Cl. 523—201 **44 Claims**

1. A pigmented polymer blend comprising from about 60 parts to about 99.9 by weight of a pigmented, non-transparent, non-translucent thermoplastic resin wherein there is present from about 0.1 part by weight to about 30 parts by weight of pigment, per 100 parts of resin, said thermoplastic resin being selected from the class consisting of polyesters, polycarbonates and mixtures thereof, and from 0.1 part to about 40 parts of a sequentially produced multi-stage polymer comprising;

(a) A polymer core of at least about 10 parts, based on the weight of the multi-stage polymer, said core being polymerized from a styrenic monomer or a mixture of a styrenic monomer and a second monomer which is a non-styrenic monovinylidene comonomer and wherein there is at least about 50 percent by weight of said styrenic monomer in said core said core being crosslinked;

(b) A second stage comprising a polymeric soft stage polymerized from an alkyl acrylate monomer or a mixture of an alkyl acrylate and up to 50 percent of a non-crosslinking vinylidene comonomer, said soft stage being crosslinked and graftlinked; and

(c) A rigid thermoplastic outer stage polymerized from at least one monovinylidene monomer.

4,617,330

EPOXY RESIN COMPOSITION FOR CAST MOLDING

Cao M. Thai; Takayuki Oguni, both of Yokohama; Kazuhiko Kurematsu, Atsugi, and Tsuguo Kato, Fujisawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 28, 1985, Ser. No. 717,111

Claims priority, application Japan, Mar. 30, 1984, 59-61211; Sep. 28, 1984, 59-201964

Int. Cl.[4] C08K *7/10, 7/14;* **C08L** *63/00*

U.S. Cl. 523—220 **9 Claims**

1. An epoxy resin composition for cast molding comprising:

(A) an epoxy resin;

(B) a curing agent;

(C) cut fibers which are 3 to 20 μm in diameter and 3 to 1500 μm in length;

(D) inorganic powder comprised of particles such that 90% by weight or more of the particles have particle sizes of 10 μm or less and 50% by weight or more of the particles have particle sizes of 5 μm or less,

the total amount of the components (C) and (D) formulated being 40 to 225 parts by volume per 100 parts by volume of the total amount of the components (A) and (B) formulated, such that said resin composition has a viscosity which is sufficiently low to be suitable for cast molding.

4,617,331

WATER-DISPERSIBLE POLYMERS CONTAINING METAL CHELATING GROUPS

William G. Boberski, Gibsonia; Richard M. Nugent, Allison Park, and Jeffrey G. Koren, Butler, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 542,880, Oct. 17, 1983, abandoned. This application Jul. 1, 1985, Ser. No. 750,840

Int. Cl.[4] C09D *5/44, 3/58, 3/64, 3/72*

U.S. Cl. 523—420 **14 Claims**

1. A non-gelled aqueous composition comprising:

(A) a polymer containing a plurality of amino groups, and

(B) a water-solubilizing group containing a metal compound.

4,617,332

PHASE CHANGE COMPOSITIONS

Ival O. Salyer, Dayton, and Charles W. Griffen, Mason, both of Ohio, assignors to University of Dayton, Dayton, Ohio

Filed Aug. 31, 1984, Ser. No. 646,402

Int. Cl.[4] C08K *3/10, 3/20*

U.S. Cl. 524—4 **10 Claims**

1. A composition useful in thermal energy storage comprising a cementitious matrix material selected from the group consisting of hydraulic cement, gypsum, lime, and plaster of paris; and plurality of pellets or granules containing a crystalline straight chain alkyl hydrocarbon or a mixture of crystalline, straight chain, alkyl hydrocarbons, said hydrocarbon(s) having at least 14 carbon atoms and a heat of fusion greater than 30 cal/g., and said pellet or granule being formed by a process consisting essentially of dissolving or dispersing said alkyl hydrocarbon(s) in a polymer and grinding or cutting said polymer, said polymer being sufficiently compatible with said alkyl hydrocarbon such that said alkyl hydrocarbon can be dissolved or dispersed in said polymer.

4,617,333

STABILIZED POLYOLEFINIC COMPOSITIONS AND STABILIZER COMPOUNDS SUITABLE TO THAT PURPOSE

Silvestro Costanzi, S. Giuliano; Enrico Traverso, Monza; Roberto Podestà , Albisola Sup.; Damiano Gussoni, Milan, and Carlo Busetto, S. Donato, all of Italy, assignors to Enichem Sintesi, S.p.A., Palermo, Italy

Filed Mar. 8, 1985, Ser. No. 709,546
Claims priority, application Italy, Mar. 12, 1984, 20007 A/84
Int. Cl.[4] C08K 5/34
U.S. Cl. 524—96 4 Claims

1. A stabilized polyolefinic composition consisting essentially of a polyolefin and a stabilizing amount of 3,3,5,5-tetramethyl-morpholine-2-methylene-thioglycolate stearyl ester.

4,617,334

STABILIZER COMPOSITIONS FOR PVC

Thomas G. Kugele; Keith A. Mesch, and Karl R. Wursthorn, all of Cincinnati, Ohio, assignors to Morton Thiokol, Inc., Chicago, Ill.

Continuation of Ser. No. 406,586, Aug. 9, 1982, abandoned. This application Sep. 24, 1984, Ser. No. 654,580
Int. Cl.[4] C08K 5/36, 5/37, 5/56, 5/58
U.S. Cl. 524—177 8 Claims

1. A composition for stabilizing halogen-containing organic polymers against the deteriorative effects of heat comprising, in amounts such that the resulting stabilizer is synergistically active:

A. an organic antimony compound or mixture of organic antimony compounds having at least one antimony atom and at least one antimony to sulfur to carbon linkage wherein the sulfur to carbon part of each antimony to sulfur to carbon linkage is derived from the group consisting of mercaptides, mercapto acids, mercaptoesters or mercaptoalkyl esters of carboxylic acids and combinations thereof;

B. an organic mercaptan-containing compound or mixture of organic mercaptan containing compounds selected from the group consisting of hydrocarbyl mercaptan, mercaptoesters, mercaptoalcohols, mercapto acids and mercaptoalkyl esters of carboxylic acids; and

C. a metal mercaptoalcohol or mixture of metal mercaptoalcohols having at least one non-benzylic tin or antimony atom having bonded directly thereto at least one mercaptoalcohol group through the sulfur of said mercaptoalcohol group.

7. A polymer composition comprising a halogen-containing organic polymer normally susceptible to heat induced deterioration, and an effective amount of the stabilizer composition according to claim 1.

4,617,335

METHOD FOR IMPROVING MOLD RELEASABILITY OF A POLYMERIC MATERIAL

Fumio Okada; Toshio Oba; Morizo Nakazato, and Kenichi Isobe, all of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jul. 23, 1985, Ser. No. 758,149
Claims priority, application Japan, Jul. 24, 1984, 59-153555
Int. Cl.[4] C08K 5/24
U.S. Cl. 524—265 8 Claims

1. A method for improving the mold releaseability of a polymeric material from a metal mold in which the polymeric material has been molded which comprises admixing the polymeric material with an organopolysiloxane having, in a molecule, at least one group of the general formula

$$-C_xH_{2x}-O-R,$$

in which R is a monovalent hydrocarbon group having 8 to 30 carbon atoms and containing no terminal unsaturation and x is zero or a positive integer not exceeding 4, bonded to the silicon atom.

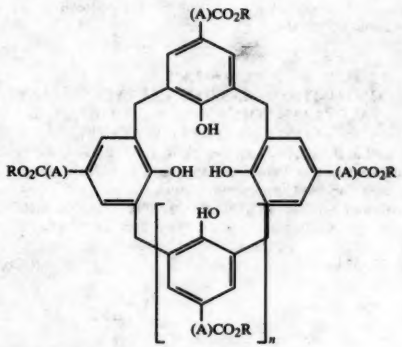
4,617,336

ACYLATED CALIXARENE STABILIZERS

Stephen D. Pastor, Yonkers, N.Y., and Paul Odorisio, Palisades Park, N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 22, 1985, Ser. No. 800,842
Int. Cl.[4] C07C 69/76; C08K 5/10
U.S. Cl. 524—291 15 Claims

1. A compound of the formula



wherein

A is a direct bond or is alkylene of 1 to 2 carbon atoms;

R, when A is a direct bond, is alkyl of 4 to 30 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, phenyl or phenyl substituted by alkyl of 1 to 18 carbon atoms;

R, when A is alkylene, is alkyl of 1 to 30 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, phenyl or phenyl substituted by alkyl of 1 to 18 carbon atoms; and

n is 1–7.

11. A composition of matter comprising an organic material subject to oxidative, thermal and actinic degradation stabilized with an effective stabilizing amount of a compound of claim 1.

4,617,337

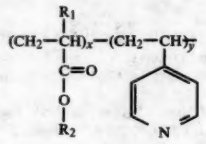
NOVEL POLYMER COMPOSITIONS BASED ON SULFONATED IONOMERS AND AMINE CONTAINING POLYMERS

Robert D. Lundberg, Bridgewater; Dennis G. Peiffer, East Brunswick, and Robert R. Phillips, Spring Lk Heights, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 663,123, Oct. 22, 1984, Pat. No. 4,552,916, which is a continuation of Ser. No. 547,911, Nov. 2, 1983, Pat. No. 4,480,063. This application Nov. 19, 1984, Ser. No. 673,005
The portion of the term of this patent subsequent to Nov. 12, 2002, has been disclaimed.
Int. Cl.[4] C08K 5/05, 5/01; C08L 91/00, 39/04
U.S. Cl. 524—399 25 Claims

1. A composition comprising interacting a blend of a neutralized sulfonated polymer containing from about 4 meq. of metal sulfonate per 100 g. of polymer up to 200 meq. per 100 g. of polymer, said sulfonate polymer being at least 95% neutralized, complexed with a second polymer containing basic nitrogen atoms incorporated, pyridine copolymerized or grafted thereon, said polymer containing basic nitrogen from about 4 meq. up to 500 meq. per 100 g. of polymer, wherein the molar ratio of metal sulfonate groups to that of basic nitrogen atoms

varies from about 0.03 to about 30; wherein said polymer containing basic nitrogen groups have the formula:



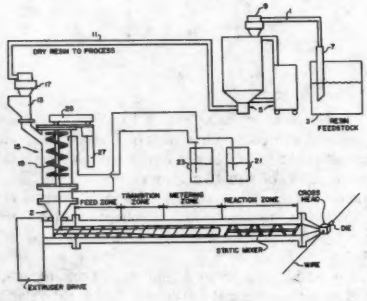
wherein R_1 is hydrogen or an alkyl group having about 1 to about 8 carbon atoms, R_2 is an alkyl group having about 2 to about 18 carbon atoms, x is about 50 to about 99.8 wt. %, and y is about 0.2 to about 50 wt. %.

4,617,338

COMPOSITIONS BASED ON ALKYLENE-ALKYL ACRYLATE COPOLYMERS AND SILANOL CONDENSATION CATALYSTS

Michael J. Keogh, Bridgewater; Scott L. Wallace, Hillsborough, and Geoffrey D. Brown, Bridgewater, all of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 498,341, Jun. 1, 1983, Pat. No. 4,489,029. This application Sep. 27, 1984, Ser. No. 654,967
Int. Cl.[4] C08L *23/08*
U.S. Cl. 524—437 **9 Claims**



1. A composition of matter consisting essentially of an ethylene-ethyl acrylate copolymer and dibutyltin dilaurate in an amount of about 0.001 to about 0.5 percent by weight based on the weight of said copolymer.

4,617,339

LACQUER, PROCESS FOR LACQUERING THEREWITH, AND ARTICLES LACQUERED THEREWITH

Johan P. Rocholl, Zwijndrecht, and Hendrikus De Jong, Maasdam, both of Netherlands, assignors to Hunter Douglas International N.V., Willmstad, Netherlands

Division of Ser. No. 345,727, Feb. 4, 1982, Pat. No. 4,457,965. This application May 10, 1984, Ser. No. 608,901
Int. Cl.[4] C08K *7/02*; C08L *33/08, 67/00, 77/00*
U.S. Cl. 524—514 **6 Claims**

1. A stoving lacquer including volatile and non-volatile ingredients capable of being stoved at stoving times extending between 15 seconds and 30 minutes at stoving temperatures up to 300° C., said lacquer comprising:

(a) a binder of an organic resinous material, and

(b) finely divided high molecular weight, inert, non-elastomeric, high wear-resistant polyamide or polyimide thermoplastic particles having a softening point of at least 180° C. but below the stoving temperature of the said binder, said particles comprising 10–40% by volume of the non-volatile ingredients and having a diameter of 2–100 microns, the major proportion of particles having a diameter of 40 microns or less; said particles being dispersed in the lacquer to have portions thereof which partially protrude from the outermost layer of the lacquer to provide a wear-resistant surface when applied to an article and to soften and become rounded through partial melting with the majority of the particles still including portions protruding partially from said outermost layer when said layer is subjected to said stoving times and temperatures.

4,617,340

SILICONE-CONTAINING FABRIC TREATMENT AGENT

Masaki Tanaka, and Hiroshi Ohashi, both of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jun. 4, 1985, Ser. No. 740,983
Claims priority, application Japan, Jun. 6, 1984, 59-115809
Int. Cl.[4] C08L *83/00*
U.S. Cl. 524—588 **7 Claims**

1. A fabric treatment agent which comprises, as the principal ingredient, a copolymer which is the polymerization product of three types of moieties including:

(a) a diorganopolysiloxane in a liquid form represented by the general formula

$$X—R^1—SiR^2_2—O)_nSiR^2_2—R^1—X,$$

in which R^1 is a divalent organic group, R^2 is a substituted or unsubstituted monovalent hydrocarbon group having from 1 to 20 carbon atoms, X is an active hydrogen-containing functional group selected from the class consisting of a hydroxy group —OH, mercapto group —SH, carboxyl group —COOH and amino group $—NH_2$ and n is a positive integer not smaller than 10;

(b) a polyol compound having polyoxyalkylene linkages in an amount from 1 to 10 moles per moles of the moiety (a) above; and

(c) a diisocyanate compound in such an amount that the molar ratio —NCO/H of the isocyanate groups —NCO in the diisocyanate com-pound to the overall hydrogen atoms of the functional groups X in the moiety (a) and the hydroxy groups in the moiety (b) is in the range from 0.05 to 1.

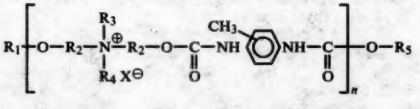
4,617,341

POLYURETHANE LATEX SIZING AGENTS FOR THE PAPER INDUSTRY AND THEIR METHOD OF MANUFACTURE

Antoine Laine, Paris, and Claude Senez, Gouvieux, both of France, assignors to Atochem, France

Filed May 20, 1985, Ser. No. 735,844
Claims priority, application France, Jun. 5, 1984, 84 08792
Int. Cl.[4] C08L *75/04*
U.S. Cl. 524—591 **11 Claims**

1. A sizing agent comprising an oligourethane latex; said urethane having the formula:



in which

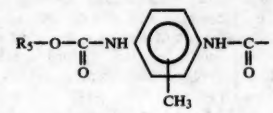
R_2 is an alkylene radical containing a C_2–C_6 radical or a polyoxyalkylenic radical of a degree of polycondensation of 1 to 4,

R_3 is an alkyl radical containing at least 7 carbon atoms, and

R_4 and X represent the remainder of the quaternizing agent R_4X

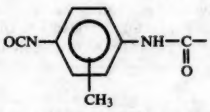
with

(a) R_1 representing

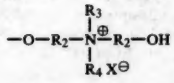


R_5 being an aliphatic radical containing C_4 as a maximum and n varying from 1 to 3; or

(b) R_1 representing



R_5 being



in which R_2, R_3, R_4 and X having the preceding definitions and n varying from 2 to 6.

4,617,342

CRYSTALLINE COPOLYAMIDE FROM TEREPHTHALIC ACID, ISOPHTHALIC ACID AND C_6 DIAMINES

Wassily Poppe, Lombard; Yu-Tsai Chen, Glen Ellyn, and Edward E. Paschke, Wheaton, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 601,863, Apr. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 466,901, Feb. 16, 1982, abandoned. This application May 16, 1985, Ser. No. 735,072

Int. Cl.[4] C08G *69/26;* C08L *77/06*

U.S. Cl. 524—606 **8 Claims**

1. A crystalline polyamide resin having improved tensile strength formed from dicarboxylic acid compounds and diamines wherein said dicarboxylic acid compounds comprise compounds of terephthalic acid (TA) and isophthalic acid (IA) in a molar ratio TA:IA of at least 80:20 to about 99:1 and wherein said diamines comprise hexamethylene diamine (HMDA) and trimethylhexamethylene diamine (TMHMDA) in a molar ratio HMDA:TMHMDA of about 98:2 to about 60:40.

4,617,343

LAMINATING ADHESIVES CONTAINING POLYMERIZED SURFACTANT

James L. Walker, Whitehouse Station, and Mourad T. Mitry, Flemington, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Apr. 23, 1984, Ser. No. 602,789

Int. Cl.[4] C08F *28/02;* C08K *3/18, 5/05*

U.S. Cl. 524—817 **11 Claims**

1. A pressure sensitive laminating adhesive polymer emulsion having a glass transition temperature of from −60° to −20° C., the emulsion polymer consisting essentially of:

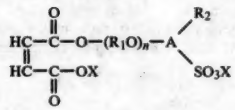
(a) at least 70% by weight of the polymer of an acrylic or methacrylic acid ester containing 4 to 12 carbon atoms or mixture of such esters;

(b) from 15 to 20% of the polymer of a water miscible vinyl ester of an aliphatic carboxylic acid containing 1 to 13 carbon atoms;

(c) from 2 to 10% of the polymer of a monoethylenically unsaturated mono- or di-carboxylic acid containing 2 to 5 carbon atoms or the hydroxyalkyl (C_2–C_4) esters thereof;

(d) from 0.75 to 10% of the polymer of a polymerizable surfactant selected from the class consisting of:

(i) ring sulfonated maleate half esters of an alkoxylated alkyl arylol having the formula:



where

R_1 is selected from the group consising of ethylene, propylene, and mixtures thereof,

R_2 is selected from the group consisting of hydrogen and alkyl groups each of which contains from 5 through 18 carbon atoms each,

A is selected from the group consisting of phenyl nuclei or phenyl nuclei and naphthyl nuclei or naphthyl nuclei,

X is selected from the group consisting of hydrogen, alkali, metals, ammonium, lower monoalkyl amines lower dialkyl amines, lower trialkyl amines, lower monoalkanol amines, lower dialkanol amines, lower trialkanol amines, heterocyclic amines, phosphates, and mixtures thereof, and

n is a number of from about 2 through 50 inclusive, provided that, when R_2 is hydrogen $(R_1O)_n$ has at least one of the following structures:

$-(PO)_p-(EO)_q-'$

$-(PO)_p-(EO)_q-(PO)_r-(EO)_s-'$ and

$-(PO)_p-(EO)_q-(PO)_r-(EO)_s-(PO)_t-(EO)_u$

wherein

p, r, and t, when present, are each an independently selected number of from about 3 through 9 inclusive;

q, s, and u, when present, are each an independently selected number of from about 1 through 4 inclusive, and when the associated (EO) entity is a terminated block, q, s, and u can each be an independently selected positive number of from 1 to 20,

P is propylene, and

E is ethylene;

(ii) compounds of the formula:

wherein

R is alkyl of 6 to 22 carbon atoms, M is H, Li, Na, K or NH_4 and n is an integer 2 to 4; and

(iii) polymerizable (allyl) sulfosuccinates;

(e) from 0 to 19% of the polymer of a half ester or salt of a dicarboxylic acid containing 2 to 8 carbon atoms in the ester portion thereof, wherein the total of components (c) and (e) are less than 20% by weight of the total polymer; and

(f) from 0 to 20% of other copolymerizable monomers. wherein the adhesive polymer emulsion is characterized by its ability to be diluted with at least 15 parts alcohol per 100 parts wet emulsion.

10. The laminating adhesive emulsion polymer of claim 1 wherein the polymerizable surfactant is a polymerizable allyl sulfosuccinate.

4,617,344

ALKYL PHOSPHONATE ESTER-MODIFIED ORGANOPOLYSILOXANE LATEX AND A METHOD FOR THE PREPARATION THEREOF

Masaki Tanaka, and Hiroshi Ohashi, both of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed May 8, 1985, Ser. No. 732,239

Claims priority, application Japan, May 22, 1984, 59-103383

Int. Cl.[4] C08L *83/00*

U.S. Cl. 524—837 **4 Claims**

1. A method for the preparation of an organopolysiloxane latex which comprises:

emulsion-polymerizing (a) 100 parts by weight of an organosilicon compound represented by the general formula

$$R_a^1R_b^2SiO_{(4-a-b)/2},$$

in which R^1 is a group selected from the class consisting of substituted and unsubstituted monovalent hydrocarbon groups having from 1 to 20 carbon atoms, R^2 is an alkoxy group or a hydroxy group, each of the groups denoted by R^1 or R^2 in a molecule being independet from the others, a is a positive number not exceeding 3 and b is zero or a positive number not exceeding 3 with the proviso that a+b is in the range from 1 to 4 inclusive, and (b) from 0.1 to 30 parts by weight of a phosphonate ester-modified alkoxy silane represented by the general formula

$$(R^3O)_{3-c}R^3{}_cSi—R^4—PO(OR^3)_2,$$

in which R^3 is a substituted or unsubstituted monovalent hydrocarbon group having from 1 to 20 carbon atoms, each of the groups denoted by R^3 in a molecule being independent from the others, R^4 is a divalent hydrocarbon group having from 1 to 8 carbon atoms and c is zero, 1 or 2, in an aqueous medium containing (c) a surface active agent selected from the class consisting of the sulfonic acid type having the structural formula

$$R^5—C_6H_4—SO_3H,$$

in which R^5 is a monovalent aliphatic hydrocarbon group having at least 6 carbon atoms, and the sulfate ester type having the formula

$$R^6OSO_3H,$$

in which R^6 is a monovalent organic group having at least 6 carbon atoms.

4,617,345

POLYMER MIXTURE WHICH COMPRISES AN AROMATIC POLYCARBONATE RESIN AND AN IMPACT STRENGTH-IMPROVING AGENT

Willem L. Sederel, TD Roosendaal, Netherlands, assignor to General Electric Company, Mt. Vernon, Ind.

Filed Jul. 31, 1985, Ser. No. 760,886

Claims priority, application Netherlands, Aug. 20, 1984, 8402555

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—67 **4 Claims**

1. A polymer mixture which comprises an aromatic polycarbonate resin and an impact strength-improving agent, characterized in that the polymer mixture comprises the following constituents:

(a) 86–99% by weight of an aromatic polycarbonate resin;

(b) 0.5–4% by weight of one or more partially hydrogenated block copolymers consisting of at least two terminal polymer blocks A of a monoalkenyl-arylene having an average molecular weight of 5,000–125,000 and at least one intermediate polymer block B of a conjugated diene having an average molecular weight of 10,000–300,000, the terminal polymer blocks A forming 8–55% by weight of the block copolymer, while not more than 25% by weight of the aromatic double bonds of the polymer blocks A and at least 80% of the aliphatic double bonds of the polymer blocks B have been reduced by hydrogenation, and

(c) 0.5–10% by weight of one or more graft copolymers having an elastomeric core built up for more than 50% by weight from a polymerized diene, optionally a second phase built up from a polymerized vinyl monomer grafted on the core and having an enveloping phase (shell) built up from the polymerized product of one or more monomers selected from the group consisting of a C_1–C_6 alkyl acrylate, a C_1–C_6 alkyl methacrylate, acrylic acid, methacrylic acid and a mixture of one or more of the said monomers optionally with a cross-linking agent, which enveloping phase is grafted on the core and on the second phase optionally present, the quantities of a, b and c being calculated with respect to the overall quantity of a+b+c.

4,617,346

POLYPHENYLENE ETHER RESIN COMPOSITION

Nobuharu Sonoda, Osaka, Japan, assignor to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 694,367, Jan. 24, 1985, abandoned. This application Jan. 13, 1986, Ser. No. 818,073

Claims priority, application Japan, Jan. 24, 1984, 59-10614

Int. Cl.[4] C08L *61/04*

U.S. Cl. 525—68 **9 Claims**

1. A polyphenylene ether resin composition comprising:

(A) 10 to 90 parts by weight of polyphenylene ether resin which is selected from the group consisting of phenylene ether homopolymer and phenylene ether copolymer,

(b) 5 to 88 parts by weight of polystyrene resin which is selected from the group consisting of polystyrene, rubber-modified polystyrene, styrene-butadiene copolymer, styrene/butadiene/acrylonitrile copolymer, styrene/α-methylstyrene copolymer, poly-α-methylstyrene, and rubber-modified styrene/α-methylstryene copolymer, and

(C) 1 to 25 parts by weight of an alkyl acrylate core-shell graft copolymer which comprises a core and a shell further comprising an intermediate layer and an outermost layer,

(1) 50 to 75% by weight of said core comprising a cross-linked elastic copolymer obtained by emulsion-polymerizing a monomer mixture containing 70 to 95% by weight of an alkyl acrylate having 2 to 12 carbon atoms in the alkyl group thereof and 30 to 5% by weight of butadiene in the presence of 0.01 to 3% by weight of a crosslinking agent based upon the amount of the monomer mixture,

(2) 45 to 10% by weight of said intermediate layer comprising a cross-linked polymer obtained by graft-polymerizing on the core (1) a monomer mixture containing 50 to 80% by weight of styrene and 50 to 20% by weight of methyl methacrylate in the presence of 0.01 to 2% by weight of a cross-linking agent based upon the amount of the monomer mixture, and

(3) 5 to 25% by weight of said outermost layer cormprising a cross-linked polymer obtained by graft-polymerizing on the intermediate layer (2) methyl methacrylate in the presence of 0.01 to 2% by weight of a crosslinking agent based upon the amount of methyl methacrylate,

wherein the sum of the components (A), (B) and (C) is 100 parts by weight.

4,617,347

SULFUR CURABLE SILICONE RUBBER

Richard M. D'Sidocky, Ravenna, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 9, 1985, Ser. No. 773,767

Int. Cl.[4] C08F *8/00*

U.S. Cl. 525—105 **23 Claims**

1. A sulfur curable silicone rubber which is comprised of the reaction product of (1) a silicone rubber which contains pen-

dent vinyl groups and (2) an N-chlorothio-sulfonamide having the formula

where R^1 and R^2 are selected from the group consisting of alkyl radicals having 1–20 carbon atoms, aralkyl radicals having 7–20 carbon atoms, alkaryl radicals having from 7–20 carbon atoms, and haloaryl radicals having 6–10 carbon atoms and where R^1 is also selected from radicals having the formula

where R^3 and R^4 are individually selected from said alkyl, aralkyl, and haloaryl radicals and where R^3 and R^4 can be joined together to represent $—CH_2—_n$ radicals where n is an integer of 4 to 7.

4,617,348

CROSSLINKABLE COMPOSITION COMPRISING MODIFIED AMINOEPOXY RESINS-II

Ray A. Dickie, Birmingham, and Saiyed B. A. Qaderi, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 10, 1984, Ser. No. 679,962

Int. Cl.[4] C08L *63/10*

U.S. Cl. 525—112 **36 Claims**

1. A crosslinkable composition of matter comprising first and second resins,

said first resin being substantially gel-free diene functional aminoepoxy resin of number average molecular weight (Mn) about 1000–18,000, comprising the reaction product of diepoxide reactant with first reactant comprising amine functional conjugated diene chain extending reactant selected from the group consisting of di-secondary amine functional bis-diene, mono-primary amine functional diene, and a mixture of any of them,

said second resin being substantially gel-free blocked dieneophile functional aminoepoxy resin, other than said diene functional aminoepoxy resin, of number average molecular weight (Mn) about 1000–18,000, comprising the reaction product of diepoxide reactant with second reactant comprising amine functional blocked dieneophile chain extending reactant selected from the group consisting of di-secondary amine functional bis-blocked dieneophile, mono-primary amine functional blocked dieneophile, and a mixture of any of them,

at least one of said first reactant and said second reactant further comprising modifying agent comprising hydroxy functional secondary amine, and at least one of said first reactant and said second reactant further comprising second modifying agent selected from the group consisting of secondary amine terminated butadiene acrylonitrile copolymer resin, carboxy terminated butadiene acrylonitrile copolymer resin, and any mixture thereof, said second modifying agent having number average molecular weight about 1400–4400 and amine or carboxy, respectively, equivalent weight of about 700–2200.

4,617,349

URETHANE RESIN COMPOSITIONS

Kohji Nasu, Nishinomiya, and Ichiro Minato, Kobe, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 28, 1985, Ser. No. 792,491

Claims priority, application Japan, Nov. 2, 1984, 59-232161

Int. Cl.[4] C08G *18/62*

U.S. Cl. 525—123 **7 Claims**

1. A urethane resin composition which comprises (i) a polyisocyanate component having 20/80 to 80/20 of a weight ratio on a solid basis of an α,α,α′,α′-tetramethyl-xylylene diisocyanate derivative to a hexamethylene diisocyanate derivative and (ii) an acrylic polyol.

4,617,350

FLUORINE-CONTAINING RESIN COMPOSITION FOR OPTICAL USE

Kazuhiko Maeda, and Akira Kawada, both of Tokyo, Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Feb. 5, 1986, Ser. No. 826,373

Claims priority, application Japan, Feb. 20, 1985, 60-30621

Int. Cl.[4] C08L *27/16, 33/04*

U.S. Cl. 525—153 **11 Claims**

1. A resin composition suitable for optical uses, consisting essentially of a blend of an acrylic ester polymer with a copolymer of vinylidene fluoride and hexafluoroacetone.

4,617,351

MELT EXTRUDABLE COMPOSITION OF PERFLUOROCARBON POLYMERS

Thomas A. Heckel, Jr., Hockessin, Del., and Felice J. Rizzo, Mt. Pleasant, S.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 19, 1985, Ser. No. 811,109

Int. Cl.[4] C08L *27/12, 23/16, 27/18*

U.S. Cl. 525—199 **6 Claims**

1. A melt extrudable thermoplastic perfluorocarbon polymer having a melt viscosity of between 1×10^2 and 1×10^6 Pa.s containing up to about 1 percent by weight of a hydrocarbon polymer, said hydrocarbon polymer being present in an amount which results in an increased extrusion rate before electrical flows are observed, as compared to the same perfluorocarbon polymer not containing any hydrocarbon polymer.

4,617,352

ETHYLENE POLYMER COMPOSITION FOR BLOW MOLDING

Matthew A. Page; William J. Libbey, and Allan J. Lundeen, all of Ponca City, Okla., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 508,696, Jun. 28, 1983, Pat. No. 4,525,322. This application May 30, 1985, Ser. No. 739,417

Int. Cl.[4] C08L *23/06*

U.S. Cl. 525—240 **11 Claims**

1. A polyethylene resin composition comprising high molecular weight, medium molecular weight and low molecular weight fractions, which are selected from the group consisting of homopolymers of ethylene and copolymers of ethylene and/or olefins having three to twelve carbons, wherein;

(A) the molecular weight of the high molecular weight component (H-MW) ranges from 590,000 to 860,000 and comprises 12 to 25 percent by weight of the total resin;

(B) the molecular weight of the medium molecular weight component (M-MW) ranges from about 75,000 to about 600,000 and comprises 5 to 83 percent by weight of the total resin;

(C) the molecular weight of the low molecular weight component (L-MW) ranges from about 10,000 to about 100,000 and comprises 5 to 83 percent by weight of the total resin; and wherein the ratio of H-MW/M-MW ≧ 1.7

and the ratio of M-MW/L-MW≧1.7, wherein the density of the total resin ranges from 0.940 to 0.970 and the melt index at a 2.16 kilogram load ranges from about 0.01 to about 2.0.

4,617,353

ELECTRICALLY CONDUCTIVE POLYMER BLEND

Ronald E. Myers, Strongsville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Oct. 7, 1985, Ser. No. 784,905
Int. Cl.[4] C08L 27/06, 65/00, 75/04
U.S. Cl. 525—245 **14 Claims**

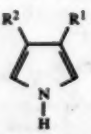
1. A process for preparing an electrically conductive polyblend of a polypyrrole or substituted polypyrrole and a thermoformable, normally insulating matrix polymer, comprising,

(a) forming a solution of said matrix polymer in a liquid solvent in which the matrix polymer is substantially soluble, and,

(b) forming a poly(2,5-pyrrole) in situ in said solution by contacting

(i) a finely divided anhydrous polymerization initiator selected from the group consisting of halides of a Group VIII metal selected from iron, cobalt and nickel, with

(ii) an anhydrous essentially pure liquid pyrrole monomer in a ratio of initiator to pyrrole monomer in the range of from about 0.1 to about 1, optionally in solution with the matrix polymer, at a temperature in the range from above the freezing point of said solution of matrix polymer to below its boiling point, so as to form said poly(2,5-pyrrole) which contains an ion selected from the group consisting of said Group VIII metal, halogen, and combinations thereof as charged species, said monomer having the structure



wherein,

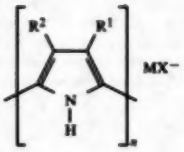
R^1 is selected from the group consisting of hydrogen, alkyl having from 1 to about 6 carbon atoms, cycloalkyl having from 3 to about 7 ring carbon atoms one or more of which may be substituted, alkoxyalkyl having from 3 to about 24 carbon atoms, and benzyl which may optionally be ring-substituted with halogen or lower alkyl having from 1 to about 6 carbon atoms;

R^2 is selected from the group consisting of hydrogen, hydroxyphenyl which may be ring-substituted, and an acyclic ether selected from the group consisting of (i) alkoxy represented by —OR^3, wherein R^3 represents alkyl having from 1 to about 12 carbon atoms, alkoxyalkyl having from 2 to about 24 carbon atoms, phenyl which may be substituted, benzyl or substituted benzyl, heteroaryl or substituted heteroaryl; (ii) polyalkoxy represented by the structure CH_3—$[OCH_2CH_2]_{n'}$— wherein n' is an integer in the range from 1 to about 20; and (iii) R^4—O—R^4 wherein either R^4 or R^5 is a linking group selected from phenyl and benzyl, each of which may be substituted, alkyl having from 1 to 24 carbon atoms, and cycloalkyl having from 3 to about 7 ring carbon atoms one or more of which may be substituted; and,

R^1 may be substituted with R^2, and if so substituted, each R^2 substituent may be the same or different;

whereby said polyblend formed consists essentially of a PP/subs PP phase homogeneously blended with said matrix polymer phase, said polyblend having a conductivity in the range from 10^{-3} to about 150 S/cm.

14. A conductive porous membrane consisting essentially of a polyblend of (i) a thermoformable, normally insulating matrix (polymer) and (ii) a polypyrrole or substituted polypyrrole substantially homogeneously distributed within said matrix polymer, said polypyrrole or substituted polypyrrole containing an ion selected from the group consisting of said Group VIII metal, halogen, and combinations thereof as charged species, said polypyrrole or substituted polypyrrole having the structure



wherein,

n is an integer in the range from 2 to about 100, and more preferably in the range from about 5 to about 20;

M represents a Group VIII metal selected from the group consisting of iron, nickel, and cobalt;

X represents chlorine, fluorine or bromine;

R^1 is selected from the group consisting of hydrogen, alkyl having from 1 to about 6 carbon atoms, cycloalkyl having from 3 to about 7 ring carbon atoms one or more of which may be substituted, alkoxyalkyl having from 3 to about 24 carbon atoms, and benzyl which may optionally be ring-substituted with halogen or lower alkyl having from 1 to about 6 carbon atoms;

R^2 is selected from the group consisting of hydrogen, hydroxyphenyl which may be ring-substituted, and an acyclic ether selected from the group consisting of (i) alkoxy represented by —OR^3, wherein R^3 represents alkyl having from 1 to about 12 carbon atoms, alkoxyalkyl having from 2 to about 24 carbon atoms, phenyl which may be substituted, benzyl or substituted benzyl, heteroaryl or substituted heteroaryl; (ii) polyalkoxy represented by the structure CH_3—$[OCH_2CH_2]_{n'}$— wherein n' is an integer in the range from 1 to about 20; and (iii) R^4—O—R^4 wherein either R^4 or R^5 is a linking group selected from phenyl and benzyl, each of which may be substituted, alkyl having from 1 to 24 carbon atoms, and cycloalkyl having from 3 to about 7 ring carbon atoms one or more of which may be substituted; and,

R^1 may be substituted with R^2, and if so substituted, each R^2 substituent may be the same or different;

whereby said membrane has a conductivity in the range from 10^{-3} to about 150 S/cm.

4,617,354

ADHESIVE COMPOSITIONS WITH THERMOREVERSIBLE CROSSLINKING AND USES THEREFOR

Daniel Augustin, Bernay, France; Christian Leriche, Tokyo, Japan, and Pierre Poisson, Bernay, France, assignors to Atochem, France

Filed Jan. 24, 1985, Ser. No. 694,223
Claims priority, application France, Jan. 31, 1984, 84 01436
Int. Cl.[4] C08F 265/02
U.S. Cl. 525—301 **10 Claims**

1. An adhesive composition with thermoreversible crosslinking prepared by the reaction of the vinyl ether functions of a divinyl ether having the formula CH_2=CH—O—R—O—CH=CH_2, wherein R is aliphatic, aromatic or cycloaliphatic, with the carboxyl functions of polymer produced by the polymerization of an olefin with an ethylenically unsaturated monocarboxylic acid, the quantity of the divinyl ether being from 0.1 to 5 percent by weight and the quantity of polymer being from 99.9 to 95 percent by weight.

4,617,355

CROSS-LINKED NYLON BLOCK COPOLYMERS

James D. Gabbert, Wilbraham, Mass., and Ross M. Hedrick, St. Louis, Mo., assignors to DSM RIM Nylon VOF, Maastricht, Netherlands

Continuation-in-part of Ser. No. 623,257, Jun. 21, 1984, abandoned, which is a continuation-in-part of Ser. No. 560,714, Dec. 12, 1983, abandoned. This application Nov. 13, 1984, Ser. No. 670,188

Int. Cl.[4] C08L 67/00; C08F 283/04

U.S. Cl. 525—420 42 Claims

1. A polymer prepared by reaction of at least one acyl lactam functionalized material and at least 0.02 equivalent of at least one polyfunctional amine wherein the acyl lactam functionalized material is derived from an elastomeric polymer having a molecular weight between about 200 and about 15,000, wherein the acyl lactam group is a C_3 to C_{14} lactam derivative of a carboxylic acid, a sulfonic acid, a phospho-acid or a thiocarboxyl derivative of a carboxylic acid and wherein the amine has a molecular weight of at least 60 and its polyfunctionality is provided by at least 2 primary or secondary amine groups.

4,617,356

TEMPERATURE SENSITIVE POLYMER COMPOSITIONS

Tomiharu Hosaka, Kyoto; Yoshio Kishimoto, and Wataru Shimotsuma, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jun. 13, 1985, Ser. No. 744,196

Claims priority, application Japan, Jun. 15, 1984, 59-123046; Jun. 15, 1984, 59-123047; Oct. 19, 1984, 59-219503

Int. Cl.[4] C08L 77/12

U.S. Cl. 525—429 18 Claims

1. A temperature sensitive polymer composition comprising a polymer matrix which contains at least 20 wt % of a modified polyamide resin having N-alkyl-substituted amido units or ether-amido units, and a phenolic compound/aldehyde polycondensate dispersed in said polymer matrix in an amount of from 5 to 30 parts by weight per 100 parts by weight of said polymer matrix.

4,617,357

PROCESS FOR REDUCING THE CONTENT OF CHLORINE IN GLYCIDYL COMPOUNDS

Kemal D. Pallie, Choëx, and Gerald Dessauges, Montreux, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 16, 1985, Ser. No. 776,319

Claims priority, application Switzerland, Sep. 24, 1984, 4556/84

Int. Cl.[4] C08G 59/14

U.S. Cl. 525—506 11 Claims

1. A process for reducing the content of chlorine in a glycidyl compound in which the glycidyl groups are bonded to ether-oxygen, N or S atoms, which comprises reacting the glycidyl compound, dissolved in a halogen-free inert organic solvent, with a tin hydride of the formula I or II

$$R_3SnH \quad (I)$$

or

$$R_2SnH_2 \quad (II)$$

in which each radical R independently of one another is alkyl with 1 to 4 C atoms or phenyl, at least 1 equivalent of the tin hydride of the formula I or II being employed per equivalent of chlorine present, in the presence of a catalytic amount of an initiator which forms free radicals, and then isolating the glycidyl compound from the reaction solution.

4,617,358

PROCESS FOR THE PRODUCTION OF HIGH MOLECULAR WEIGHT THERMOPLASTIC RESINS

Herbert Eichenauer, Dormagen, and Karl-Heinz Ott, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 30, 1985, Ser. No. 739,280

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1984, 3421354

Int. Cl.[4] C08F 2/26

U.S. Cl. 526—81 2 Claims

1. A process for the production of high molecular weight uncross-linked vinyl polymers by emulsion polymerization, consisting essentially of,

(a) from 1 to 20 parts, by weight, of vinyl monomer selected from styrene, α-methyl styrene, p-methyl styrene, vinyl toluene, (meth) acrylonitrile, methyl (meth) acrylate, vinyl acetate, N-phenyl maleic imide or a mixture thereof;

(b) from 0.1 to 3.0 parts, by weight, of a mono- or di-ol of a C_8–C_{22} aliphatic hydrocarbon compound; and

(c) from 80 to 400 parts, by weight, of water;

(d) from 0.05 to 0.5 parts, by weight, of a water soluble initiator or initiator system at a temperature of from 50° to 65° C. to form a reaction mixture;

and, in process step (b), which is carried out after a reaction time of from 5 minutes to 1 hour at that temperature separately adding to the reaction mixture,

(e) from 80 to 99 parts, by weight, of vinyl monomer or monomer mixture; and

(f) from 0.1 to 3.0 parts, by weight, of an anionic emulsifier in the form of an aqueous solution; and reacting over a period of from 1 to 10 hours until polymerization is completed.

4,617,359

HIGH MOLECULAR WEIGHT POLYACRYLAMIDE SYNTHESIS

Robert A. Smith, Uniontown, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 649,622, Sep. 12, 1984, abandoned. This application Nov. 15, 1985, Ser. No. 798,545

Int. Cl.[4] C08F 4/40

U.S. Cl. 526—93 20 Claims

1. A process for the homopolymerization of acrylamide and for the copolymerization of acrylamide with vinyl monomers to produce ultra-high molecular weight water soluble polymers comprising initiating said homopolymerization or said copolymerization with a ferrous/hydroperoxide redox initiator system and carrying out said homopolymerization or said copolymerization in an aqueous reaction medium at a temperature of from about −20° C. to about 40° C.; wherein the ultra-high molecular weight polymer produced has a weight average molecular weight of greater than about 40,000,000.

4,617,360

PROCESS FOR THE POLYMERIZATION OF α-OLEFINS

Charles Bienfait, Keerbergen, Belgium, assignor to Solvay & Cie., Brussels, Belgium

Continuation of Ser. No. 911,814, Jun. 2, 1978, abandoned. This application Jun. 25, 1982, Ser. No. 392,135

Claims priority, application Luxembourg, Jun. 6, 1977, 77489

Int. Cl.[4] C08F 4/02, 10/00

U.S. Cl. 526—114 26 Claims

1. In a process for the polymerization of ethylene which is carried out in the presence of an organoaluminum compound and a solid catalyst complex prepared by reacting together:

(1) at least one compound (M) selected from organic oxygen-containing magnesium compounds which only contain metal/oxygen/organic radical bonds,

(2) at least one compound (T) selected from organic oxygen-containing titanium compounds having the general formula $(TiO_x(OR)_{4-2x})_n$ in which R represents an organic

radical, x is a number such that $0 \leqq x \leqq 1.5$ and n is an integer, and

(3) at least one aluminum halide (A), said aluminum halide (A) being employed at the end of the preparation, the improvement wherein the aluminum halide is an organoaluminum chloride of the general formula AlR_nCl_{3-n} in which R is an isobutyl radical and n is 1.

4,617,361

PROCESS AND CATALYST FOR OLEFIN POLYMERIZATION

Joel L. Martin, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 264,513, May 18, 1981, Pat. No. 4,384,982. This application Feb. 3, 1983, Ser. No. 463,172

Int. Cl.[4] C08F *4/02, 10/00*

U.S. Cl. 526—114 **14 Claims**

1. A process for the polymerization of alpha-olefins monomers comprising contacting said monomers under polymerization conditions with a catalyst system comprising (A) a catalyst prepared by

(1) reacting at least one metal halide selected from the halides of scandium, yttrium, and rare earth metals having atomic numbers in the range of 57 to 71 with at least one transition metal compound in which the transition metal is titanium and in which the transition metal is bonded to at least one atom selected from the group consisting of oxygen, nitrogen, and sulfur, and said oxygen, nitrogen, and sulfur atoms are in turn bonded to a carbon-containing radical, then

(2) reacting the product of (1) with an organometallic compound comprising an organoaluminum compound, and then

(3) treating the resulting solid with a halide ion exchanging source comprising at least one of the group consisting of halides of titanium, and (B) a cocatalyst comprising organometallic compounds of metals of Groups IA, IIA, IIB, and IIIA.

4,617,362

INVERSE EMULSION POLYMERS WITH IMPROVED INCORPORATION OF DIALLYLDIMETHYLAMMONIUM CHLORIDE

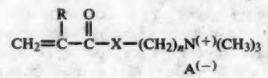
Larry W. Becker, and Eric H. Larson, both of Marcellus, N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 687,700, Dec. 31, 1984, abandoned. This application May 16, 1985, Ser. No. 734,436

Int. Cl.[4] C08F *2/32*

U.S. Cl. 526—209 **7 Claims**

1. A process for enhancing the incorporation of diallyldimethylammonium chloride into an acrylamide polymer, said process comprising forming a polymerizable mixture in an aqueous system of diallyldimethylammonium chloride and acrylamide in the presence of emulsifiers, introducing into the polymerizable mixture a polymerizable promoter monomer having a higher reactivity with acrylamide than diallyldimethylammonium chloride, and polymerizing said promoter containing polymerizable mixture, said polymerizable promoter monomer being present in an amount sufficient to provide improved incorporation of diallyldimethylammonium chloride into the acrylamide polymer and being



wherein

R is —H or CH_3;

X is —O—, or —NH—;

n has a value of 2–4; and

A is an ion selected from the group consisting of Cl^-, $CH_3SO_4^-$ HSO_4^- and NO_3^-.

4,617,363

ω-PERFLUOROALKYL-α-OLEFIN POLYMERS

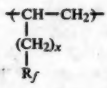
Aaron C. L. Su, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 28, 1985, Ser. No. 707,013

Int. Cl.[4] C08F *14/18*

U.S. Cl. 526—253 **3 Claims**

1. A polymer containing recurring units of the structure



wherein x is a cardinal number of from 2 to 8, and R_f is perfluoroalkyl of 2–10 carbon atoms.

4,617,364

WET ADHESION PROMOTERS FOR EMULSION POLYMERS

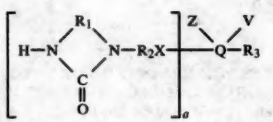
Kazys Sekmakas, Palatine, and Raj Shah, Schaumburg, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Dec. 9, 1982, Ser. No. 448,254

Int. Cl.[4] C07D *209/56, 239/03, 403/00*; C08F *218/14*

U.S. Cl. 526—263 **13 Claims**

1. A monoethylenically unsaturated copolymerizable monomer having the formula



in which

R_1 is alkylene having 2 to 3 carbon atoms;

R_2 is alkylene having 2 to 10 carbon atoms;

X is a radical selected from NH—, S—, and O— which initially carried Z;

Z is an isocyanate-reactive hydrogen atom initially carried by R_2X;

a is an integer from 1 to 5 to consume all the isocyanate groups on the polyisocyanate noted hereinafter other than the one consumed by R_3;

Q is an organic aliphatic or aromatic polyisocyanate carrying a+1 isocyanate groups;

V is an isocyanate-reactive hydrogen atom initially carried by R_3;

R_3 is the residue of a monohydroxy C_1–C_{12} alkyl maleate or fumarate which is connected to Q via its hydroxy group; and

X and R_3 are connected to Q via the isocyanate groups therein and Z and V are carried by the nitrogen atoms in said isocyanate groups.

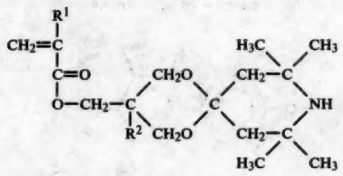
9. A copolymer consisting essentially of copolymerized monoethylenically unsaturated monomers including from 0.1% to 10% of the monomer recited in claim 1.

4,617,365
ETHYLENE COPOLYMER

Akiyoshi Oonishi; Shuhei Doi, and Takeo Shimada, all of Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Oct. 1, 1985, Ser. No. 782,564
Claims priority, application Japan, Oct. 1, 1984, 59-206101
Int. Cl.[4] C08F *210/02*
U.S. Cl. 526—265 2 Claims

1. An ethylene copolymer comprising ethylene and a compound of formula (I)



(I)

wherein R^1 represents a hydrogen atom or a methyl group, and R^2 represents a methyl group or an ethyl group, the content of the compound of formula (I) being from 0.005 to less than 10 mole %, and the copolymer being a random copolymer prepared by radical polymerization of ethylene and the compound of formula (I).

4,617,366
PROCESS FOR MANUFACTURING ETHYLENE TERPOLYMERS AND ETHYLENE COPOLYMERS

Pierre Gloriod, Lillebonne; Joel Audureau, Noeux les Mines, and Maurice Pellegrini, Lievin, all of France, assignors to Societe Chimique Des Charbonnages, S.A., France

Filed Aug. 22, 1985, Ser. No. 768,443
Claims priority, application France, Aug. 23, 1984, 84 13137
Int. Cl.[4] C08F *2/34*
U.S. Cl. 526—272 10 Claims

1. A process for the manufacture of radical ethylene terpolymers comprising 50 to 99.2% by weight of moieties derived from ethylene, 0.5 to 40% by weight of moieties derived from an alkyl (meth)acrylate and 0.3 to 10% by weight of moieties derived from maleic anhydride by copolymerizing, in the presence of at least one free-radical initiator, a mixture of ethylene, an alkyl (meth)acrylate and maleic anhydride, in a device comprising a primary compressor, the delivery pressure of which is between 200 and 300 bars, connected to a secondary compressor which is connected directly to a polymerization reactor, fresh ethylene being fed at the intake of the said primary compressor and said copolymerization being carried out in the said polymerization reactor under a pressure of between 1,000 and 2,500 bars and at a temperature of between 140° and 280° C., wherein at least one of the alkyl (meth)acrylate and maleic anhydride is fed directly into the said polymerization reactor.

4,617,367
METHYL METHACRYLATE SYRUP COMPOSITION

Katsushi Watanabe, Kamakura; Takafumi Kageyama; Taisaku Kano, both of Yokohama; Koichi Hirai, Hatano, and Yoshinobu Ichihara, Mobara, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Nov. 28, 1984, Ser. No. 675,568
Int. Cl.[4] C08F *220/14*
U.S. Cl. 526—273 6 Claims

1. A methyl methacrylate syrup composition comprising an intimate mixture of 1–99 parts by weight of a first polymer-in-monomer syrup (A) and 99–1 parts by weight of a second polymer-in-monomer syrup which can be either (B_1) or (B_2), the sum of said first syrup (A) and said second syrup (B_1) or (B_2) being 100 parts by weight, wherein said syrups (A), (B_1) and (B_2) are as folows:

(A) a polymer-in-monomer syrup obtained by copolymerizing to a polymerization degree of 10–60% a mixture which comprises (a) 5–95 wt. % of methyl methacrylate monomer, (b) 95–1 wt. % of one or more monomers having reactivity with glycidyl groups, containing at least one ethylenically-unsaturated bond, being co-polymerizable with methyl methacrylate, and selected from the group consisting of:

(i) carboxyl-containing monomers, said carboxyl-containing monomers themselves being selected from the group consisting of methacrylic acid, maleic anhydride, maleic acid, fumaric acid and acrylic acid;

(ii) hydroxyl-containing alkyl (meth)acrylate monomers;

(iii) phosphorous- or phosphoric-containing acrylic ester monomers; and

(iv) amino-containing monomers, said amino-containing monomers themselves being selected from the group consisting of N-methyl-aminoethyl methacrylate, 4-N-methyl-aminocyclohexyl methacrylate, N,N-dimethylaminoethyl methacrylate, methacrylic amide, crotonic amide, vinyl amine, N-ethylvinyl amine, allyl amine, diallyl amine, N-methylallyl amine, N-methylaminoethyl acrylate, 4-N-methyl-aminocyclohexyl acrylate, N,N-dimethylaminoethyl acrylate and acrylic amide; and

(c) 0–94 wt. % of one or more monomers not having reactivity with glycidyl groups, containing at least one ethylenically-unsaturated bond, being copolymerizable with methyl methacrylate and selected from the group consisting of (meth)acrylates, styrene and styrene derivatives, the sum of said monomers (a), (b) and (c) being 100 wt. %;

(B_1) a polymer-in-monomer syrup obtained by copolymerizing to a polymerization degree of 10–60% a mixture which comprises (d) 3–97 wt.% of one or more monomers containing at least one glycidyl group and at least one ethylenically-unsaturated bond, being copolymerizable with methyl methacrylate and selected from the group consisting of glycidyl (meth)acrylates, beta-methylglycidyl (meth)acrylates, N-glycidyl (meth)acrylic amides, (meth)acrylic acid addition products of an epoxy resin composed of a polyhydric phenol and an epihalohydrin and allyl glycidyl ether and (e) 97–3 wt. % of one or more monomers selected from the group consisting of methyl methacrylate and the monomers defined in sub-paragraph (c) above, the sum of said monomers (d) and (e) being 100 wt. %;

(B_2) a polymer-in-monomer syrup containing (f) 5–95 wt. % of a copolymer obtained by copolymerizing 3–97 wt. % of one or more monomers containing at least one glycidyl group and selected from the group consisting of glycidyl (meth)acrylates, beta-methylglycidyl (meth)acrylates and allyl glycidyl ether and 97–3 wt. % of one or more other copolymerizable monomers selected from the group consisting of (meth)acrylates, fumarates, maleates, styrene, alpha-methylstyrene, (meth)acrylic amide and (meth)acrylonitrile, having a number average molecular weight of 1,500–50,000 and containing a glycidyl group, in (g) 95–5 wt. % of one or more monomers selected from the group consisting of methyl methacrylate and the monomers defined in sub-paragraph (c) above.

4,617,368

PROCESS FOR THE PRODUCTION OF COLORLESS AROMATIC POLYESTER AND POLYESTER CARBONATES

Dieter Freitag; Ludwig Bottenbruch, both of Krefeld, and Uwe Hucks, Alpen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 10, 1984, Ser. No. 680,158

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1983, 3346946

Int. Cl.[4] C08G *8/02*

U.S. Cl. 528—126 7 Claims

1. A process for the production of colourless, heatstable and hydrolysis-stable, pure aromatic polyesters and polyester carbonates which comprises interfacial polycondensation of an aromatic dicarboxylic acid dichloride and a diphenolate, and additionally phosgene to produce polyester carbonates, wherein the dicarboxylic acid dichloride is obtained by chlorination from the dimethyl ester of the corresponding acid, and a tertiary cycloaliphatic amine is used as a catalyst.

4,617,369

POLYESTER POLYMERS OF 3-HYDROXY-4'-(4-HYDROXYPHENYL)BENZOPHENONE OR 3,4'-DIHYDROXYBENZOPHENONE AND DICARBOXYLIC ACIDS

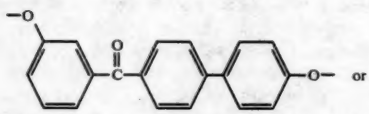
Gia Huynh-Ba, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 4, 1985, Ser. No. 772,619

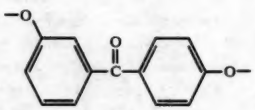
Int. Cl.[4] C08G *8/02*

U.S. Cl. 528—128 108 Claims

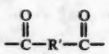
1. A melt anisotropic polyester having an inherent viscosity of at least 0.5 as measured from a 0.5 g solution of polymer in 100 ml of an equal volume mixture of p-chlorophenol and 1,2-dichloroethane, and a heat of fusion of less than 1.5 joule per gram consisting essentially of at least 10 mole percent glycol derived repeating units of the structure



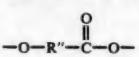
or



and the remainder, repeating glycol derived units of the structure —O—R—O— where —R— is an arylene group containing 6–14 carbon atoms, and diacid derived repeating units of the structure



where —R'— is an alkylene group containing 4 to 14 carbon atoms or an arylene group consisting 6 to 14 carbon atoms and monoacid-monohydroxy derived repeating units of the structure



where —R''— is an arylene containing 6 to 14 carbon atoms.

4,617,370

THERMOTROPIC LIQUID CRYSTALLINE POLYMERS

Robert W. Lenz, Amherst, Mass., and Dean T. Behm, Yorktown Heights, N.Y., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 30, 1986, Ser. No. 824,386

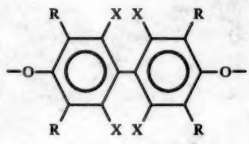
Int. Cl.[4] C08G *63/60*

U.S. Cl. 528—191 20 Claims

1. A thermotropic polymer capable of forming an anisotropic melt, the polymer comprising at least one recurring unit selected from each of the following groups:

(a) a remnant of at least one aromatic dicarboxylic acid;

(b) aromatic dioxy moieties of the formula:



wherein each R independently is phenyl or lower alkyl or lower alkoxy of up to about four carbon atoms, and each X independently is a moiety which will electrophilically substitute into the position depicted for X in the formula, with the proviso that at least one X is not H; and

(c) a remnant of at least one hydroxyaromatic carboxylic acid;

the units being selected such that the polymer has a melting point of from about 250° C. to about 400° C.

4,617,371

NOVEL POLYMERIC LIQUID CRYSTALS AND METHODS FOR THEIR PREPARATION

Alexandre Blumstein, 2 Regina Dr., Chelmsford, Mass. 01824, and Jawed Asrar, Lowell, Mass., assignors to Alexandre Blumstein, Chelmsford, Mass.

Filed Nov. 29, 1982, Ser. No. 445,081

Int. Cl.[4] C09K *19/52;* G02F *1/13;* C08G *63/16*

U.S. Cl. 528—194 2 Claims

1. A cholesteric polymeric liquid crystalline compound comprising a linear polyester which is produced by condensing in substantially equimolar proportions 4, 4'-dihydroxy-2, 2'-dimethylazoybenzene with a mixture of trans-traumatoyl chloride and (+) 3-methyladipoylchloride.

4,617,372

PROCESS FOR PRODUCING POLYPHENYLENE ETHER

Kazunori Yano; Teruhisa Goto, and Katsuhiro Abe, all of Mie, Japan, assignors to Mitsubishi Petrochemical Co, Ltd., Tokyo, Japan

Filed Nov. 20, 1985, Ser. No. 800,033

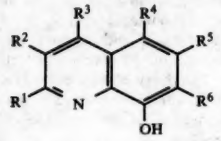
Int. Cl.[4] C08G *65/44*

U.S. Cl. 528—216 15 Claims

1. A process for producing a polyphenylene ether by oxidative polymerization of phenols in the presence of a catalyst, wherein said catalyst comprises an effective amount of each of:

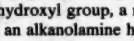
(a) a divalent manganese salt selected from the group consisting of manganese (II) chloride, manganese (II) bromide, manganese (II) iodide, manganese (II) carbonate, manganese (II) acetate, manganese (II) nitrate, manganese (II) phosphate and hydrated compounds of the same;

(b) an oxine compound having the formula:



wherein R^1, R^2, R^3, R^4, R^5 and R^6 each is a hydrogen atom, an alkyl group having 1 to 5 carbon atoms, an alkoxy group having 1 to 5 carbon atoms, a halogen atom, a hydroxyl group, a nitro group or an amino group;

(c) an alkanolamine having the formula:



wherein R^7 is an alkylene group having 1 to 4 carbon atoms, and n is an integer of 1 to 3; and

(d) an alkaline compound selected from the group consisting of sodium hydroxide, potassium hydroxide and sodium methoxide.

4,617,373

CONDENSATION POLYMERS AND PRODUCTS THEREFROM

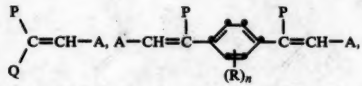
Wayne P. Pruett; Richard H. S. Wang, both of Kingsport; Samuel D. Hilbert, Jonesborough, and Max A. Weaver, Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

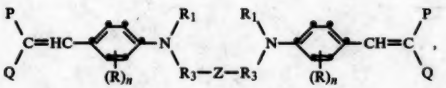
Continuation-in-part of Ser. No. 702,106, Feb. 15, 1985. This application Jan. 28, 1986, Ser. No. 823,424

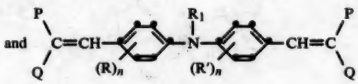
Int. Cl.[4] C08G *63/44, 69/44, 73/16*

U.S. Cl. 528—288 **20 Claims**

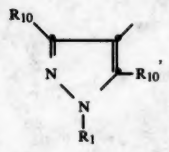
1. A composition comprising molding or fiber grade condensation polymer having copolymerized therein a total of from 1.0 to about 5,000 ppm of at least one reactive compound selected from those of the formulae







wherein each A is selected from the following radicals:



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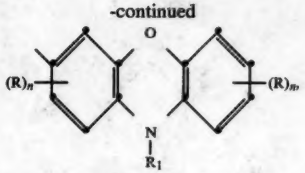

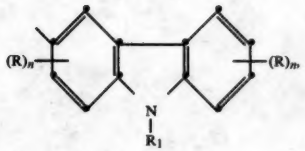

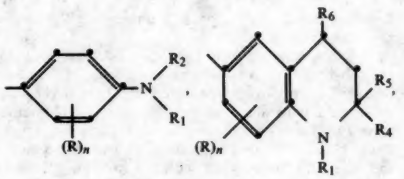

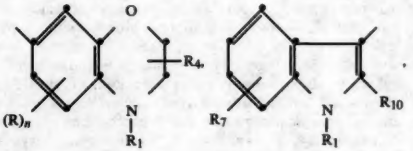

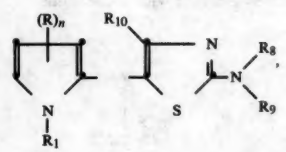

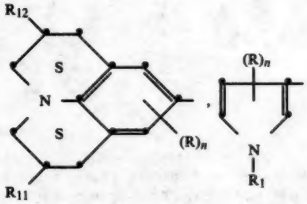

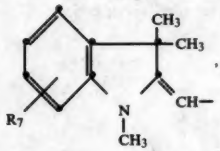

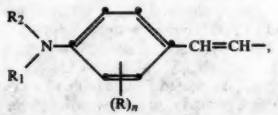

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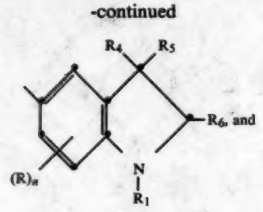
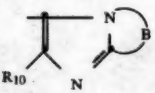
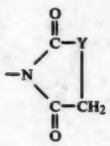




wherein:

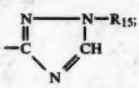
R and R' are selected from hydrogen, fluorine, chlorine, bromine, alkyl, alkoxy, phenyl, phenoxy, alkylthio, and arylthio; n is 0, 1, 2;

R_1 and R_2 are selected from hydrogen; cycloalkyl; cycloalkyl substituted with one or two of alkyl, —OH, alkoxy, halogen, or hydroxy substituted alkyl; phenyl; phenyl substituted with alkyl, alkoxy, halogen, alkanoylamino, carboxy, cyano, or alkoxycarbonyl; straight or branched lower alkenyl; straight or branched alkyl of 1–8 carbons and such alkyl substituted with the following: hydroxy; halogen; cyano; succinimido; hydroxysuccinimido; acyloxysuccinimido; glutarimido; phenylcarbamoyloxy; phthalimido; 4-carboxyphthalimido; phthalimidino; 2-pyrrolidono; cyclohexyl; phenyl; phenyl substituted with alkyl, alkoxy, halogen, hydroxy alkanoylamino, carboxy, cyano, or alkoxycarbonyl; alkylsulfamoyl; vinylsulfonyl; acrylamido; sulfamyl; benzoylsulfonicimido; alkylsulfonamido; phenylsulfonamido; alkoxycarbonylamino; alkylcarbamoyloxy; alkoxycarbonyl; alkoxycarbonyloxy; alkenylcarbonylamino; groups of the formula

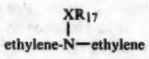


wherein Y is —NH—,

—O—, —S—, or —CH_2O—; —S—R_{14}; $SO_2CH_2CH_2SR_{14}$; wherein R_{14} is alkyl, phenyl, phenyl substituted with halogen, alkyl, alkoxy, alkanoylamino, cyano, or alkoxycarbonyl; pyridyl; pyrimidinyl; benzoxazolyl; benzimidazolyl; benzothiazolyl; radicals of the formulae



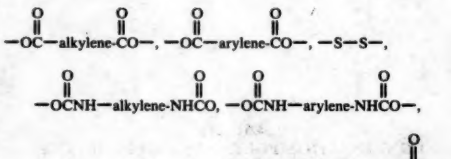
—OXR_{16}; —$NHXR_{16}$; —$X—R_{16}$; —$CONR_{15}R_{15}$; and —$SO_2NR_{15}R_{15}$; wherein R_{15} is selected from H, aryl, alkyl, and alkyl substituted with halogen, —OH, phenoxy, aryl, —CN, cycloalkyl, alkylsulfonyl, alkylthio, alkanoyloxy, or alkoxy; X is —CO—, —COO—, or —SO_2—; R_{16} is selected from alkyl and alkyl substituted with halogen, hydroxy, phenoxy, aryl, cyano, cycloalkyl, alkylsulfonyl, alkylthio, alkanoyloxy, and alkoxy; and when X is —CO—, R_{16} also can be hydrogen, amino, alkenyl, alkylamino, dialkylamino, arylamino, aryl, or furyl; alkoxy; alkoxy substituted with hydroxy, cyano, alkanoyloxy, or alkoxy; phenoxy; phenoxy substituted with one or more of alkyl, carboxy, alkoxy, carbalkoxy, or halogen; R_1 and R_2 can be a single combined group such as pentamethylene, tetramethylene, ethyleneoxyethylene, ethylene sulfonylethylene, or



which, with the nitrogen to which it is attached, forms a ring; R_{17} is alkyl, aryl, or cycloalkyl;

R_3 is alkylene, arylene, aralkylene, alkyleneoxy, or alkyleneoxyalkylene;

Z is a direct single bond, OCO, O, S, SO_2, $R_{17}SO_2N$=,



arylene, or alkylene;

R_4, R_5, and R_6 are each selected from hydrogen and alkyl;

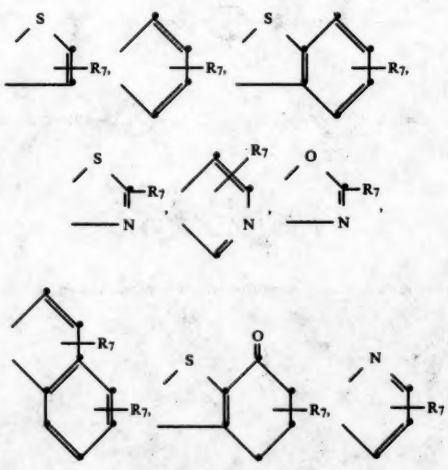
R_7 is carboxy, carbalkoxy, or $(R)_n$;

R_{10} is hydrogen, alkyl, and aryl;

R_8 and R_9 are each selected from hydrogen and substituted or unsubstituted alkyl, aryl, or cycloalkyl;

R_{11} and R_{12} are each selected from hydrogen, alkyl, hydroxyl, or acyloxy;

B represents the atoms necessary to complete a five or six membered ring and is selected from



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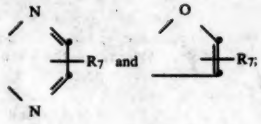
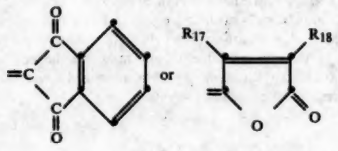


each P and Q are selected from cyano, carbalkoxy, carbaryloxy, carbaralkyloxy, carbamyl, carboxy, N-alkylcarbamyl, N-alkyl-N-arylcarbamyl, N,N-dialkylcarbamyl, N-arylcarbamyl, N-cyclohexylcarbamyl, aryl, 2-benzoxazolyl, 2-benzothiazolyl, 2-benzimidazolyl, 1,3,4-thiadiazol-2-yl, 1,3,4-oxadiazol-2-yl, SO_2 alkyl, SO_2 aryl, and acyl, or P and Q may be combined as



wherein R_{17} is defined above and R_{18} is CN, COOH, CO_2 alkyl, carbamyl, or N-alkylcarbamyl;

wherein at least one of A, P, and Q for each dye molecule must be or bear a condensable group selected from carboxy, carbalkoxy, carbaryloxy, N-alkylcarbamyloxy, acyloxy, chlorocarbonyl, carbamyloxy, N-(alkyl)$_2$carbamyloxy, amino, alkylamino, hydroxyl, N-phenylcarbamyloxy, cyclohexanoyloxy, and carbocyclohexyloxy; and

wherein in the above definitions, each alkyl, aryl, or cycloalkyl moiety or portion of a group or radical may be substituted where appropriate with hydroxyl, acyloxy, alkyl, cyano, alkoxycarbonyl, halogen, alkoxy, or aryl, aryloxy, or cycloalkyl; said compounds having one or more methine units, absorbing in the range of from about 350 nm to about 650 nm, are nonextractable from said polymer and are stable under the polymer processing conditions.

4,617,374
UV-ABSORBING CONDENSATION POLYMERIC COMPOSITIONS AND PRODUCTS THEREFROM

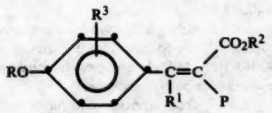
Wayne P. Pruett; Richard H. S. Wang, both of Kingsport; Samuel D. Hilbert, Jonesborough, and Max A. Weaver, Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 702,106, Feb. 15, 1985. This application Jan. 28, 1986, Ser. No. 823,425

Int. Cl.[4] C08G *63/44, 69/44, 73/16*

U.S. Cl. 528—288 **10 Claims**

1. A polyester composition having a maximum light absorbance within the range of from about 320 nm to about 380 nm and having reacted therein a total of from about 1.0 to about 5,000 parts by weight per million parts by weight of polyester of at least one UV-absorbing compound of the formula



which is nonextractable from the polyester and stable under the polyester processing conditions, wherein:

R is hydrogen, alkyl, substituted alkyl, aryl, substituted aryl, cycloalkyl, substituted cycloalkyl, or alkenyl;

R^1 is hydrogen, or alkyl, aryl, or cycloalkyl, all of which may be substituted;

R^2 is hydrogen or any radical which does not interfere with condensation with the polyester;

R^3 is hydrogen or 1–3 substituents selected from alkyl, substituted alkyl, alkoxy, substituted alkoxy, and halogen; and

P is cyano or a group selected from carbamyl, aryl, alkylsulfonyl, arylsulfonyl, heterocyclic, alkanoyl or aroyl, all of which groups may be substituted.

4,617,375
POLYAMIDE, FROM CONDENSED CYCLIC DICARBOXYLIC ACID AND BRANCHED CHAIN DIAMINE

Josef Pfeifer, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

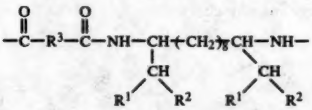
Filed Jul. 16, 1985, Ser. No. 755,382

Claims priority, application Switzerland, Jul. 24, 1984, 3576/84

Int. Cl.[4] C08G *69/26*

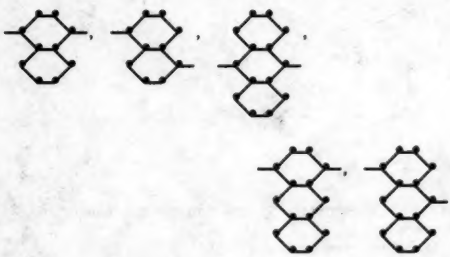
U.S. Cl. 528—344 **6 Claims**

1. A polyamide, formed from at least one dicarboxylic acid and diamine, having a reduced solution viscosity of at least 0.3 dl/g, measured on a 0.5% solution in m-cresol at 25° C., and having 100 mol %, relative to the polyamide, of recurring structural elements of formula I



(I)

wherein R^1 is alkyl having 1 to 4 C atoms, and R^2 is alkyl having 1 to 8 C atoms, or R^1 and R^2 together are tri-, tetra- or pentamethylene, R^3 is a radical of the formulae



the six-membered rings being aliphatic or aromatic hydrocarbon radicals.

4,617,376
PROCESS FOR RECOVERING GLUCAGON FROM PANCREAS GLANDS

David G. Maskalick, Indianapolis, and Marie T. Anderson, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 750,636, Jul. 1, 1985, abandoned. This application Feb. 24, 1986, Ser. No. 833,310

Int. Cl.[4] C07K *7/34*

U.S. Cl. 530—308 **21 Claims**

1. Process for the purification of glucagon from a glucagon salt cake containing pancreas gland-sourced glucagon, which comprises

(1) dissolving said glucagon salt cake in an aqueous medium containing a water-miscible organic solvent;

(2) contacting the glucagon salt cake solution with a hydro-

phobic adsorption support at a pH less than about 4 or greater than about 7.5 and at conditions under which the glucagon is adsorbed on said hydrophobic adsorption support;

(3) eluting glucagon from said hydrophobic adsorption support with an aqueous solution containing a water-miscible organic solvent to obtain a first glucagon-containing solution;

(4) contacting a solution containing glucagon eluted from said hydrophobic adsorption support, said solution having a pH of from about 7.5 to about 10.5, with an anion exchange support at conditions under which the glucagon is adsorbed on said anion exchange support;

(5) eluting glucagon from said anion exchange support to obtain a second glucagon-containing solution; and

(6) recovering glucagon having increased purity.

4,617,377

SYNERGISTINE DERIVATIVES AND THEIR PREPARATION

Jean-Pierre Corbet, Ecully; Claude Cotrel, Paris; Daniel Farge, Thiais, and Jean-Marc Paris, Vaires sur Marne, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

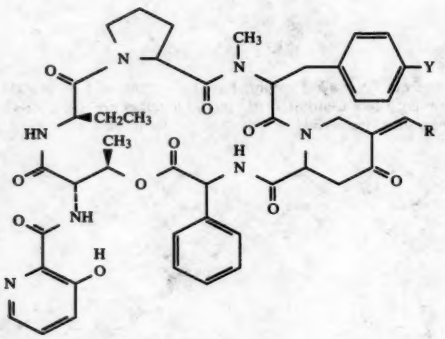
Filed Jul. 12, 1984, Ser. No. 630,256

Claims priority, application France, Jul. 13, 1983, 83 11706

Int. Cl.[4] C07K *5/12*

U.S. Cl. 530—317 **7 Claims**

1. A synergistine of the formula:



in which Y represents hydrogen or dimethylamino, and R represents:

(a) hydrogen or hydroxyl;

(b) a radical of the formula:

in which R_1 and R_2, which are identical or different, each represent

(i) hydrogen;

(ii) phenyl or pyridyl each of which is unsubstituted or substituted by a dialkylamino radical of which the alkyl part has 1 to 4 carbon atoms in a linear or branched chain,

(iii) alkyl of 1 to 10 carbon atoms in a linear or branched chain, which is unsubstituted or substituted by hydroxyl, mercapto, carboxyl, pyridyl or anilino or substituted by alkylamino or dialkylamino of which at least one alkyl is itself substituted by hydroxyl, mercapto, carboxyl or anilino,

(iv) alkenyl of 3 or 4 carbon atoms or

(v) alkynyl of 3 to 4 carbon atoms, or alternatively

(vi) R_1 and R_2 together form, with the nitrogen atom to which they are bonded, a 5-membered or 6-membered heterocyclic ring, which is unsubstituted or substituted by an alkyl radical, or

(c) a halogen atom, a trimethylsilyloxy or dialkylphosphoryloxy radical or a radical of the formula:

$$-OSO_2R_3$$

or $-OCOR_4$

in which R_3 is alkyl, trifluoromethyl or trichloromethyl or phenyl unsubstituted or substituted by halogen or by alkyl or nitro, and R_4 is defined in the same way as R_3 or represents alkylcarbonylmethyl, 2-alkylcarbonylethyl, alkoxycarbonylmethyl, 2-alkoxycarbonylethyl or alkoxy, the abovementioned alkyl portions or radicals being linear or branched unless stated otherwise and containing 1 to 4 carbon atoms each, in its isomeric forms where such exist and mixtures thereof, and also its addition salts with acids, its metal salts and its addition salts with nitrogen bases, when they exist.

4,617,378

PURIFICATION OF BIOLOGICALLY ACTIVE HUMAN IMMUNE INTERFERON

Menachem Rubinstein, Givat Shmuel; Jossef Friedlander, Bat Yam, and Dina Fischer, Ramat Gan, all of Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel

Filed Jan. 18, 1984, Ser. No. 571,735

Claims priority, application Israel, Feb. 13, 1983, 67896

Int. Cl.[4] C07K *15/26, 3/28;* A61K *45/02;* C12P *21/00*

U.S. Cl. 530—351 **14 Claims**

1. A process for isolating a biologically active human interferon gamma protein species, without contamination or inactivation by sodium dodecyl sulfate, said species being selected from the group consisting of the 21k and 26k subtypes, which comprises in combination:

(a) contacting impure interferon gamma containing at least one of said subtypes with a controlled pore glass absorbent, and eluting said interferon, obtaining said interferon in selected fractions as an eluate of enhances purity;

(b) concentrating the eluate of step (a) by ultrafiltration on a membrane, the fraction retained on said membrane being interferon of further enhanced purity; and

(c) passing the retained fractions of step (b) at least once through a cation-exchange matrix, and eluting at least one fraction containing said human biologically active interferon gamma protein species essentially free of non-interferon proteins, and also essentially free of other species of human interferon gamma.

4,617,379

HIGH TITER CYTOMEGALOVIRUS IMMUNE SERUM GLOBULIN

Milton B. Dobkin, Lafayette, and Robert E. Louie, Berkeley, both of Calif., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jun. 14, 1983, Ser. No. 504,105

Int. Cl.[4] A61K *39/00*

U.S. Cl. 530—388 **10 Claims**

1. A method for preparing a human immune serum globulin having a titer of antibody to cytomegalovirus in the range of about 1:150,000–1:1,225,000 determined by an enzyme-linked immunosorbent assay which comprises

(a) screening plasma from donors who have not been vaccinated with a cytomegalovirus vaccine for a titer of antibody to cytomegalovirus of at least about 1:60,000 determined by an enzyme-linked immunosorbent assay,

(b) pooling plasma donations of said titer of antibody to cytomegalovirus, and

(c) preparing an immune serum globulin from said pooled plasma.

7. A human immune serum globulin produced by the method of claim 1 having a titer of antibody to cytomegalovirus of about 1:150,000–1:1,225,000 determined by an enzyme-linked immunosorbent assay, said immune serum globulin being effective to treat cytomegalovirus infections.

4,617,380
PROCESS FOR THE PREPARATION OF CONCENTRATED STABLE LIQUID DYE SOLUTIONS OF CI DIRECT YELLOW 11 UTILIZING AN EXTENDED SURFACE SILICA FILTER AID DURING A DESALTING PROCEDURE

James W. Hinson, Jackson, and Jo A. Cleverdon, Mobile, both of Ala., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 11, 1984, Ser. No. 649,343
Int. Cl.[4] C09B *27/00, 46/00;* **D06P** *1/90*
U.S. Cl. 534—576 **8 Claims**

1. A process for the preparation of a liquid dyestuff of CI Direct Yellow 11 (Paper Yellow 11) in stable form, from the tetrasodium complex of this stilbeneazo(xy) base-catalyzed condensation of 4-nitrotoluene-2-sulfonic acid using as the starting material, the reaction mass, the wet cake or the dried technical grade of the condensed tetrasodium complex which comprises the steps of forming an aqueous suspension of said starting material; admixing to said suspension an extended surface filter aid; acidifying said suspension with a strong inorganic acid to a pH in the range of from about 2.5 to about 1.5; to form the free acid complex of said Direct Yellow 11; filtering said suspension through a filter, pre-coated with said extended surface filter aid, wherein said filtrate is the aqueous component of said suspension and said filter cake comprises the absorbed free acid form of the stilbeneazo(xy) dye complex; washing said filter cake with water until free from the sodium salt of said inorganic acid; slurrying the washed filter cake with an alkanolamine/water mixture in an amount sufficient to provide an aqueous phase in the pH range 6.5 to 7.5 to convert said free acid complex in said slurry to the soluble liquid alkanolamine stilbeneazo(xy) complex; filtering the slurry and collecting the filtrate; concentrating the filtrate by removal of sufficient water to provide a stable liquid dyestuff of proper tinctorial strength.

4,617,381
PROCESS FOR THE PREPARATION OF CONCENTRATED STABLE LIQUID DYE SOLUTIONS OF CI DIRECT YELLOW 11 UTILIZING AN ALKANOL/WATER SOLVENT IN A DESALTING PROCEDURE

James W. Hinson, Jackson, and Jo A. Cleverdon, Mobile, both of Ala., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 11, 1984, Ser. No. 649,342
Int. Cl.[4] C09B *27/00, 46/00;* **D06P** *1/90*
U.S. Cl. 534—576 **9 Claims**

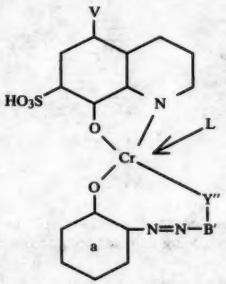
1. A process for the preparation of a liquid dyestuff of CI Direct Yellow 11 (Paper Yellow 11) in stable form, from the tetrasodium complex of this stilbeneazo(xy) condensation of 4-nitrotoluene-2-sulfonic acid, using as starting material the reaction mass, wet cake or the dried technical grade of the condensed tetrasodium complex which comprises the steps of suspending the starting material in an alkanol/water medium, said alkanol being methanol or ethanol; acidifying said suspension to a pH below about 2.5 with a strong inorganic acid; heating said suspension at reflux to form the acid state of said stilbeneazo(xy) complex; neutralizing the resultant heated mixture with an alkanolamine base to a pH above 6.3 to form a solution of the resulting stilbeneazo(xy) complex and a precipitate of the sodium salt from the alkanol/water solution of the Direct Yellow 11—alkanolamine complex and then concentrating the liquid in solution by distilling off the alkanol.

4,617,382
8-HYDROXYQUINOLINE SULFONIC ACID-AZO CHROMIUM COMPLEXES

Gerhard Back, Lörrach, Fed. Rep. of Germany; Fabio Beffa, Riehen, and Arthur Bühler, Rheinfelden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

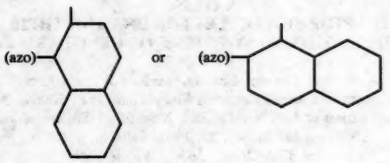
Continuation of Ser. No. 325,455, Nov. 27, 1981, abandoned, which is a continuation of Ser. No. 858,996, Dec. 9, 1977, abandoned, which is a continuation of Ser. No. 804,845, Jun. 8, 1977, abandoned, which is a continuation of Ser. No. 584,807, Jun. 9, 1975, abandoned. This application Apr. 13, 1983, Ser. No. 484,736
Claims priority, application Switzerland, Jul. 5, 1974, 9307/74
Int. Cl.[4] C09B *45/06, 45/16, 55/00;* **D06P** *3/02*
U.S. Cl. 534—693 **2 Claims**

1. A chromium complex dye of the formula



wherein

B' is



L is H_2O, ammonia, ethanol or ethanolamine;

V is hydrogen or chloro;

Y'' is —O—, —NH— or —N(lower alkyl)—; and the phenyl ring a is substituted by one or two of nitro, chloro, methyl, methoxy, sulfonamido, N-methylsulfonamido or methylsulfonyl.

4,617,383
METHOD FOR DEGUMMING AND BLEACHING DECORTICATED PLANT BAST FIBER

Michael C. Jaskowski, Pittsburgh, Pa., assignor to Helmic, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 668,294, Nov. 5, 1984, Pat. No. 4,568,739, which is a continuation-in-part of Ser. No. 554,256, Nov. 22, 1983, Pat. No. 4,481,355. This application Jan. 30, 1986, Ser. No. 824,204
Int. Cl.[4] C13L *1/00;* **D21C** *3/00;* **D01C** *1/04*
U.S. Cl. 536—2 **10 Claims**

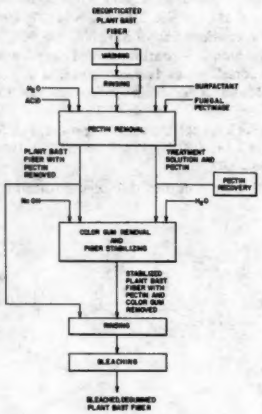
1. A method for degumming decorticated plant bast fiber to remove pectin-containing material and coloring gum therefrom comprising the steps of,

treating the plant bast fiber with an aqueous, acidic treatment solution of fungal pectinase for a period of time between about 10 to 20 minutes to degum the plant bast fiber and remove the pectin from the plant bast fiber,

maintaining said acid treatment solution at an elevated temperature and at a pH of between 2.0 and 3.5,

thereafter treating the plant bast fiber with the pectin removed therefrom with an aqueous basic treatment solution for a period of time between 15 to 60 minutes to remove the coloring gum adhering to the plant bast fiber, and

maintaining said aqueous basic treatment solution at an elevated temperature and at a pH of about 11.



4,617,384

ADAPTOR MOLECULES FOR DNA AND THEIR APPLICATION TO SYNTHESIS OF GENE-DERIVED PRODUCTS

Saran A. Narang, Ottawa, Canada, and Ray J. Wu, Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Continuation of Ser. No. 129,880, Mar. 27, 1980, abandoned. This application Sep. 29, 1982, Ser. No. 426,457

Int. Cl.[4] C07H *21/04*; C12N *15/00*

U.S. Cl. 536—27 **16 Claims**

1. Synthetic adaptor oligodeoxynucleotide molecules, for facilitating insertion of DNA information sequences into a cloning vehicle, and transcription and translation of said sequences in a host cell; each adaptor consisting of from about 8 to 20 nucleotide base pairs or incomplete pairs in their structure and consisting essentially of:

(a) a recognition site for a restriction endonuclease, and

(b) a signal for protein synthesis, selected from a start signal and a stop signal, said start signal being downstream of said recognition site and said stop signal being upstream of said recognition site; said signal being at an end of the adaptor molecule.

4,617,385

QUATERNARY AMMONIUM SALTS OF CARBOXYMETHYLCELLULOSE

Hajime Namikoshi, and Takeo Ohmiya, both of Himeji, Japan, assignors to Daicel Chemical Industries Ltd., Osaka, Japan

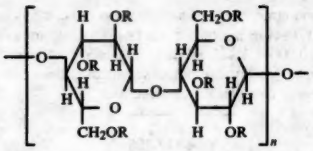
Filed Jun. 25, 1985, Ser. No. 748,775

Claims priority, application Japan, Jul. 3, 1984, 59-138697

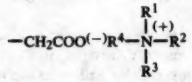
Int. Cl.[4] C08B *15/06, 11/00*

U.S. Cl. 536—98 **10 Claims**

1. A quaternary ammonium salt of carboxymethylcellulose having the formula:



wherein R is a hydrogen atom or a quaternary ammonio carboxymethyl group, and n is an integer from 10 to 1000, provided that a degree of substitution by carboxymethyl group per anhydrous glucose unit in said carboxymethylcellulose is 1.5 or more and the quaternary ammonio carboxymethyl group has the subformula:



where

(i) R^1–R^4 are each a $C_{1\text{-}20}$ straight chained or branched and saturated or unsaturated aliphatic hydrocarbon group,

(ii) three of R^1–R^4 are each said hydrocarbon group, and the remaining one is an aralkyl group or trialkylammoniumalkyl group,

(iii) two of R^1–R^4 are said hydrocarbon group and the remaining two are an aralkyl group and mono- or dialkylphenoxyalkyleneoxy alkyl group, or

(iv) one or two of R^1–R^4 are said hydrocarbon group and the remaining two or three form a ring together with an adjacent nitrogen atom.

4,617,386

PROCESS FOR THE PRODUCTION OF ^{18}F-2-DEOXY-2-FLUORO-D-GLUCOSE

David R. Elmaleh, Brookline, Mass.; Shlomo Levy, Jerusalem, Israel; Chyng-Yann Shiue, East Setauket, and Alfred P. Wolf, Setauket, both of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

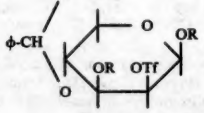
Filed Apr. 25, 1983, Ser. No. 488,311

Int. Cl.[4] C07H *1/00*

U.S. Cl. 536—122 **5 Claims**

1. A process for the production of ^{18}F-2-deoxy-2-fluoro-D-glucose which comprises the steps of:

(a) producing a compound of the formula:



where R is methyl, ethyl or propyl and Tf is trifluoromethanesulfonyl by reaction of the corresponding methyl, ethyl or propyl compounds with trifluoromethanesulfonyl anhydride at 0° C. to 30° C. in an inert organic solvent in the presence of a nitrogenous organic base which is soluble in the solvent;

(b) reacting the resulting compound with a fluorinating agent which is $[^{18}F]CsHF_2$ or $[^{18}F]RbF$ in an inert organic solvent with heating at 100° C. to 150° C.; and

(c) hydrolyzing the resulting compounds to remove the alkyl groups with BBr_3, BCl_3 or concentrated hydrochloric acid.

4,617,387

BISMORPHOLINES AND A PROCESS FOR THEIR PREPARATION

Peter Haas, Haan; James M. Barnes, Wermelskirchen, and Wilhelm Goyert, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

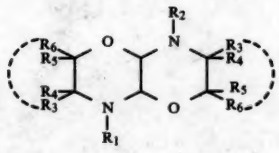
Filed Aug. 15, 1984, Ser. No. 640,907

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1983, 3331436

Int. Cl.[4] C07D *265/28*

U.S. Cl. 544—74 7 Claims

1. A 2,3,2',3'-bis-morpholine derivative compound corresponding to the formula:



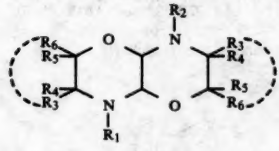
wherein

R_1 and R_2 may be identical or different and represent methyl or cyclohexyl, the groups

R_3 and R_6 form a cyclohexane group, while R_4 and R_5 represent hydrogen and

wherein the cycloalkyl groups may optionally contain inert substituents comprising a member selected from the group consisting of C_1–C_7-alkyl, chlorine and bromine.

2. A 2,3,2',3'-bis-morpholine derivative compound corresponding to the formula

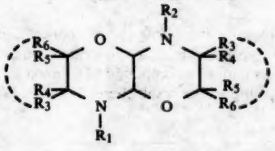


wherein

R_1 and R_2 represent cyclohexyl and

R_3, R_4, R_5 and R_6 represent hydrogen.

3. A process for the preparation of a 2,3,2',3'-bis-morpholine derivative compound according to the formula



which consists of reacting at a temperature of about 40°–100° C. in aqueous solution or a solvent containing water

(a) glyoxal with

(b) an N-mono-substituted amino alcohol corresponding to the formula

$R_{1,2}$

wherein

R_1 and R_2 may be identical or different and represent methyl or cyclohexyl and

R_3, R_4, R_5 and R_6 represent hydrogen or the groups R_3 and R_6 form a cyclohexane group while R_4 and R_5 represent hydrogen and wherein the cycloalkyl groups may optionally contain inert substituents comprising a member selected from the group consisting of C_1–C_7-alkyl, chlorine and bromine.

4,617,388

HERBICIDAL SULFONAMIDES

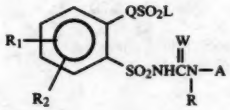
James J. Reap, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 697,375, Feb. 1, 1985, Pat. No. 4,576,633, which is a division of Ser. No. 477,969, Mar. 23, 1983, Pat. No. 4,515,624. This application Dec. 30, 1985, Ser. No. 814,405

Int. Cl.[4] C07D *491/048, 491/052, 401/12, 413/12*

U.S. Cl. 544—116 1 Claim

1. A compound having the formula



wherein

W is O or S;

R is H or CH_3;

Q is O or NR_3;

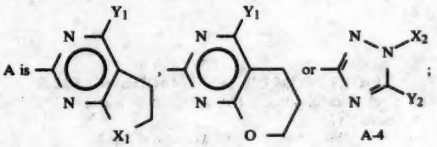
L is NR_5R_6 or $N(OCH_3)CH_3$;

R_1 is H, F, Cl, Br, CH_3, OCH_3, CF_3 or NO_2;

R_2 is H or Cl;

R_3 is H or C_1–C_3 alkyl;

R_5 and R_6 are independently C_1–C_3 alkyl, or R_5 and R_6 may be taken together to be $—(CH_2)_4—$, $—(CH_2)_5—$ or $—(CH_2)_2O(CH_2)_2—$;



A-2 A-3 A-4

X_1 is O or CH_2;

Y_1 is H, CH_3, OCH_3 or Cl;

X_2 is CH_3, CH_2CH_3 or CH_2CF_3;

Y_2 is CH_3, OCH_3 or SCH_3;

provided that when W is S, then R is H; and their agriculturally suitable salts.

4,617,389

MITOMYCIN ANALOGS

William A. Remers, Tucson, Ariz., assignor to University Patents, Inc., Westport, Conn.

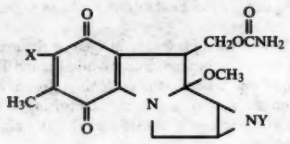
Continuation of Ser. No. 264,187, May 15, 1981, abandoned. This application Dec. 15, 1983, Ser. No. 561,787

The portion of the term of this patent subsequent to May 19, 1998, has been disclaimed.

Int. Cl.[4] C07D *487/04*; A61K *31/40*

U.S. Cl. 544—142 10 Claims

1. A compound of the formula,



wherein Y is hydrogen or lower alkyl and X is a carboxamido or mercapto or methylenedioxy substituted anilino.

4,617,390

S-TRIAZINE DERIVATIVES

Udo Hoppe, Hamburg; Karl Seib, Weinheim; Paul Naegele, Neuhofen, and Roland Martin, Kaiserslautern, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

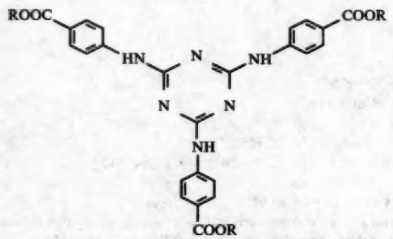
Continuation of Ser. No. 467,745, Feb. 18, 1983, abandoned. This application Jun. 4, 1985, Ser. No. 741,194

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1982, 3206398

Int. Cl.[4] C07D *251/70*

U.S. Cl. 544—197 **3 Claims**

1. A compound of the formula I:



I

wherein the individual radicals R are identical and are each C_6–C_{12} alkyl, or a polyoxyethylene radical which contains 1 to 6 ethylene oxide units and whose terminal OH group is methylated.

4,617,391

TRIOLS FROM BICYCLIC AMIDE ACETALS

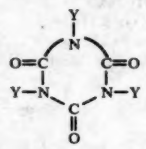
Anil Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Sep. 5, 1985, Ser. No. 772,822

Int. Cl.[4] C07D *251/34*

U.S. Cl. 544—222 **4 Claims**

1. The Triol having the structure



wherein Y represents $CH_2CH_2N(COR)CH_2CH(R')OH$ wherein R represents hydrogen, an alkyl group having from 1 to 20 carbon atoms, an aryl group having from 6 to 12 carbon atoms or an alkaryl group having from 7 to 20 carbon atoms and R' represents hydrogen, an alkyl group having from 1 to 15 carbon atoms, an aryl group having from 6 to 12 carbon atoms, an alkaryl group having from 7 to 15 carbon atoms, an alkyl ether group having from 1 to 20 carbon atoms or an aryl ether group having from 6 to 20 carbon atoms.

4,617,392

4-ALKYL-5,6-METHYLENEDIOXY-2-1[H]-QUINAZOLINONES USEFUL AS CARDIOTONIC AGENTS

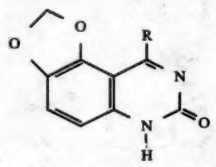
Victor T. Bandurco, Bridgewater, N.J.; Stanley C. Bell, Narberth, Pa.; Donald W. Combs, Piscataway, and Robert Falotico, Belle Mead, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Sep. 29, 1983, Ser. No. 537,228

Int. Cl.[4] C07D *487/00;* **A61K** *31/505*

U.S. Cl. 544—250 **4 Claims**

1. A compound of the formula:



wherein R is hydrogen or lower alkyl.

4,617,393

5-SUBSTITUTED-6-AMINOPYRIMIDINES, COMPOSITION AND USES AS CARDIOTONIC AGENTS FOR INCREASING CARDIAC CONTRACTILITY

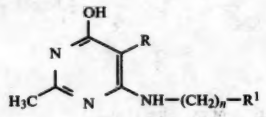
Jehan F. Bagli, Princeton, N.J., and Steven M. Peseckis, Levittown, Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Jul. 19, 1985, Ser. No. 757,214

Int. Cl.[4] C07D *239/02;* **A61K** *31/505*

U.S. Cl. 544—319 **23 Claims**

1. A compound of the formula (I)



(I)

wherein R is halogen or lower alkyl having 1 to 3 carbon atoms; R^1 is hydrogen, hydroxy, cyclopropyl, pyridinyl, 1-methyl-1H-pyrrol-2-yl, 2-furanyl, phenyl; and n is an integer from 1 to 3, and the pharmaceutically acceptable addition salts thereof.

23. A method for increasing cardiac contractility in a mammal which comprises administering to the mammal an effective cardiotonic amount of a compound of formula I or a therapeutically acceptable addition salt thereof.

4,617,394

4-METHYL-5-(UNSUBSTITUTED AND SUBSTITUTED PHENOXY)-2,6-DIMETHOXY-8-(AMINOALKYLAMINO) QUINOLINES

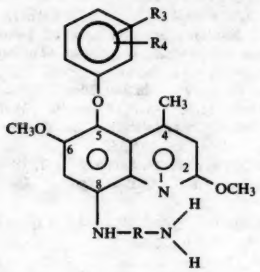
Peter Blumbergs, Royal Oak, Mich., and Maurice P. LaMontagne, Overland Park, Kans., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 15, 1985, Ser. No. 787,143

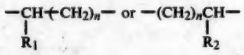
Int. Cl.[4] C07D *215/22;* **A61K** *31/47*

U.S. Cl. 546—157 **5 Claims**

1. A compound of the formula:



wherein R is an alkylene group which is



wherein n is 3 or 4, wherein R_1 and R_2 are methyl or ethyl, wherein R_3 and R_4 are hydrogen, chloro, bromo, fluoro, trifluoromethyl or methoxy groups and wherein the compound is a free amine or a pharmaceutically acceptable acid amine salt.

4,617,395

PREPARATION OF QUINOLINES

Toni Dockner, Meckenheim; Helmut Hagen, Frankenthal, and Herbert Krug, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 15, 1984, Ser. No. 660,956

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1983, 3337569

Int. Cl.[4] C07D *215/02, 215/12, 215/18, 215/20*

U.S. Cl. 546—178 **4 Claims**

1. In a process for the preparation of quinoline or a substituted quinoline by reacting aniline or a substituent aniline with an α,β-mono-unsaturated aldehyde or an acetal thereof in the presence of an acid, the improvement which comprises: reacting the aniline with the unsaturated aldehyde or acetal thereof at a temperature of from 80° to 250° C. in the presence of a mineral oil having a boiling point above 150° C., said mineral oil being selected from the group consisting of gas oil, vacuum gas oil, heavy fuel oil, technical white oil, molten paraffin wax and an aromatic hydrocarbon oil, said reaction further taking place in the presence of from 0.1 to 20% by weight of an organic acid catalyst based on the weight of the mineral oil.

4,617,396

PROCESS FOR THE PREPARATION OF DERIVATIVES OF PIPERIDINE

Charles M. Leir, New Richmond, Wis., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Continuation of Ser. No. 269,068, Jun. 2, 1981, abandoned, which is a continuation of Ser. No. 162,312, Jun. 23, 1980, abandoned, which is a continuation of Ser. No. 21,332, Mar. 19, 1979, abandoned. This application Sep. 4, 1985, Ser. No. 772,474

Int. Cl.[4] C07D *211/26*

U.S. Cl. 546—233 **4 Claims**

1. A method of preparing a 2,5-bis(2,2,2-trifluoroethoxy)-N-(2-piperidylmethyl)-benzamide which comprises:

(a) contacting 1,4-dibromobenzene with an alkali metal 2,2,2-trifluoroethoxide in the presence of cuprous or cupric ion and in a strongly polar solvent comprising 2,2,2-trifluoroethanol whereby 1,4-bis(2,2,2-trifluoroethoxy)-benzene is formed;

(b) in the presence of a Lewis acid catalyst, treating said 1,4-bis(2,2,2-trifluoroethoxy)benzene with an acetylation agent under conditions to create 2,5-bis(2,2,2-trifluoroethoxy)acetophenone:

(c) replacing the methyl moiety of the acetophenone function of said 2,5-bis(2,2,2-trifluoroethoxy)acetophenone to yield 2,5-bis(2,2,2-trifluoroethoxy)benzoic acid;

(d) treating said 2,5-bis(2,2,2-trifluoroethoxy)benzoic acid with an inorganic chloride to provide 2,5-bis(2,2,2-trifluoroethoxy)benzoic acid chloride;

(e) contacting the resultant 2,5-bis(2,2,2-trifluoroethoxy)benzoic acid chloride with 2-aminomethylpyridine, whereby there is formed 2,5-bis(2,2,2-trifluoroethoxy)-N-(2-pyridylmethyl)benzamide;

(f) treating said 2,5-bis(2,2,2-trifluoroethoxy)-N-(2-pyridylmethyl)benzamide with an agent capable of hydrogenation of the aromatic bond in the heterocyclic ring, whereby there is formed a 2,5-bis(2,2,2-trifluoroethoxy)-N-(2-piperidylmethyl)benzamide.

4,617,397

2-CHLORO OR BROMO-6-C_1C_3-ALKYLAMINO-PYRIDINE INTERMEDIATES

Kenji Tsuzuki, Shinnanyo, and Hideo Morinaka, Utsunomiya, both of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

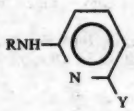
Division of Ser. No. 497,408, May 23, 1983, Pat. No. 4,560,762. This application Jun. 21, 1985, Ser. No. 747,298

Claims priority, application Japan, May 27, 1982, 57-88828; May 27, 1982, 57-88829; Jul. 7, 1982, 57-116888; Jul. 9, 1982, 57-118619; Jul. 9, 1982, 57-118620

Int. Cl.[4] C07D *213/74*

U.S. Cl. 546—304 **2 Claims**

1. A 2-alkylaminopyridine derivative of the formula



wherein

R is C_1–C_3 alkyl, and

Y is a halogen atom.

4,617,398

PHOSPHOAZIRIDINE COMPOUNDS USEFUL FOR TREATMENT OF TUMORS

Thomas J. Bardos, Snyder, and Michael E. Perlman, Amherst, both of N.Y., assignors to The Research Foundation of State University of New York, Albany, N.Y.

Filed Apr. 12, 1982, Ser. No. 367,338

Int. Cl.[4] C07D *403/02, 403/14;* **A61K** *31/395*

U.S. Cl. 548—112 **8 Claims**

1. A compound of the formula:

wherein Z is oxygen or sulfur, R_1 is hydrogen or methyl; R_2 is methyl or nitrophenyl; R_3 is

or lower alkoxy or lower alkoxy substituted by nitro-1-imidazoyl, quinone, or nitrophenyl or R_3 is —NHCOOR$_4$ wherein R_4 is lower alkyl substituted by nitrophenyl, nitro-1-imidazoyl or quinone; with the proviso that the compound must have at least one nitrophenyl, nitro-1-imidazoyl or quinone and when R_4 is nitrophenyl substituted methyl, the nitrophenyl is O-nitrophenyl.

4,617,399

2-AMINOBENZOTHIAZOLE 6-CARBONYL CHLORIDE HYDROCHLORIDE

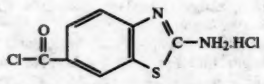
Husam A. A. Rasoul, Racine, Wis., assignor to Celanese Corporation, New York, N.Y.

Filed Apr. 1, 1985, Ser. No. 718,681

Int. Cl.[4] C07D *277/60, 277/62;* C08G *69/12*

U.S. Cl. 548—152 **1 Claim**

1. 2-Aminobenzothiazole-6-carbonyl chloride hydrochloride corresponding to the structural formula:



4,617,400

PROCESS FOR PREPARING CYCLIC UREA DERIVATIVES

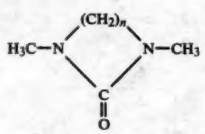
Kazuhisa Ito, Fujimi, and Yoshio Fukuda, Kawagoe, both of Japan, assignors to Kawaken Fine Chemicals Co., Ltd., Tokyo, Japan

Filed Sep. 11, 1985, Ser. No. 774,986

Int. Cl.[4] C07D *233/32*

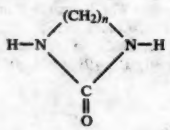
U.S. Cl. 548—317 **8 Claims**

1. A process for preparing a cyclic N,N'-dimethyl urea derivative of formula I,



(I)

in which n is 2 or 3, by reacting a cyclic urea compound of formula II,



(II)

in which n is as defined above, with formaldehyde, in a medium, in the presence of hydrogen and a hydrogenation catalyst, characterized in that said reaction is carried out in the presence of at least one member selected from the group consisting of solid acids obtained by calcining sulfuric acid or its ammonium salt and aluminum oxide and by calcining sulfuric acid or its ammonium salt, phosphoric acid or its ammonium salt and aluminum oxide.

4,617,401

8-SUBSTITUTED PYRROLIZIDINE AND QUATERNARY AMMONIUM SALTS THEREOF

Seiji Miyano; Kunihiro Sumoto, both of Fukuoka; Minoru Morita, Osaka, and Fumio Sato, Kyoto, all of Japan, assignors to Suntory Ltd., Osaka, Japan

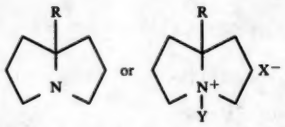
Continuation of Ser. No. 376,240, May 7, 1982, abandoned, which is a continuation-in-part of Ser. No. 258,479, Apr. 28, 1981, abandoned. This application Jan. 27, 1984, Ser. No. 574,932

Claims priority, application Japan, May 7, 1980, 55-61095

Int. Cl.[4] C07D *209/52*

U.S. Cl. 548—453 **7 Claims**

1. An 8-substituted pyrrolizidine and a quaternary ammonium salt thereof of the formula:



wherein R is an alkyl group containing C_4–C_{10} atoms, aralkyl or aryl group containing up to C_{10} atoms; a lower alkoxycarbonyl or a lower alkoxycarbonylmethyl group; a lower alkyl carboxyl group amidated with pyridinylamine, aniline, cyclohexylamine, phenylbenzylamine or methoxyphenylbenzylamine; a lower hydroxyalkyl group which has one or two phenyl, a trihalomethylphenyl or a halophenyl group; a lower alkyl group which has a hydroxyl group esterified with acetic, benzoic, cinnamic, xanthene-carboxylic or methoxybenzoic acid, or etherified with a C_2–C_{13} alcohol; a lower alkyl group having a lower alkylamino, guanidino, benzylamino, hydroxybenzylamino, methoxybenzylamino, aminobenzylamino, acetamino, benzoylamino, hydroxybenzoylamino, methoxybenzoylamino, pyridinylamino, aminobenzoylamino, N,N-dimethylamino, 2-(N,N-dimethylamino), N-methyl-N-benzylamino, N-benzyl-N-methoxy-phenylamino, N-benzyl-N-phenylamino, 2-(N-benzoyl-N-phenylamino), N-(2'-pyridinyl)-N-acetylamino or N-(2'-pyridinyl)-N-benzoylamino group; or a lower alkyl group bearing benzoyl, methoxybenzoyl, methylbenzoyl, halobenzoyl or trifluoromethylbenzoyl group; Y stands for a group quaternizing the nitrogen of the pyrrolizidine nucleus, and which is lower alkyl, phenacyl, phenyl-substituted phenacyl, or lower alkyl substituted with halogen, phenyl, phenacyl or phenylphenacyl group and X stands for halogen.

4,617,402

NOVEL XANTHENE COMPOUNDS AND THEIR PHOTOGRAPHIC USE

Alan L. Borror, Lexington; Louis Cincotta, Andover, and John W. Lee, Jr., Harvard, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

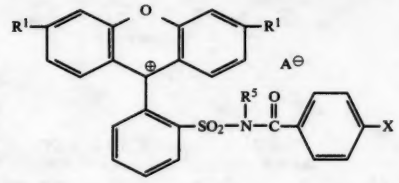
Division of Ser. No. 454,092, Dec. 28, 1982, Pat. No. 4,416,971. This application Sep. 1, 1983, Ser. No. 528,454

The portion of the term of this patent subsequent to Mar. 24, 1998, has been disclaimed.

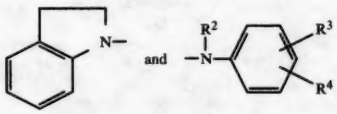
Int. Cl.[4] C07D *405/14, 311/82*

U.S. Cl. 548—455 **14 Claims**

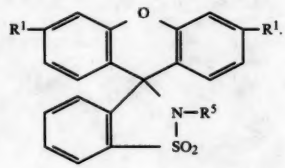
1. A compound having the formula



wherein each R^1 is the same and is selected from



R^2 is alkyl, R^3 is an electron-withdrawing group positioned ortho, meta or para to said N atom, R^4 is hydrogen, alkyl or an electron-withdrawing group positioned ortho, meta or para to said N atom; R^5 is alkyl; X is an electron-withdrawing group or an electron-donating group; and A is an anion, said compound at an alkaline pH undergoing a hydrolysis reaction to give a colorless compound of the formula



4,617,403

PROCESS FOR PREPARING A PIGMENT BASED ON 4,4',7,7'-TETRACHLOROTHIOINDIGO

Ernst Spietschka, Idstein, and Manfred Urban, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 5, 1984, Ser. No. 627,770

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1983, 3324879

Int. Cl.[4] C07D *333/64, 409/04*

U.S. Cl. 549—56 **5 Claims**

1. A process for preparing a strong, non-flocking and rheologically excellent 4,4',7,7'-tetrachlorothioindigo pigment in high yields and high purity, which comprises

(a) reacting 2,5-dichlorophenylthioglycoloyl chloride with Friedel-Crafts catalysts in inorganic acyl halides of medium oxidation state as diluent pt temperatures of −20° to +50° C. to 4,7-dichloro-3-oxythionaphthene,

(b) oxidizing the resulting 4,7-dichloro-3-oxythionaphthene in a conventional manner to crude 4,4',7,7'-tetrachlorothioindigo, and

(c) treating the crude 4,4',7,7'-tetrachlorothioindigo obtained in moist form with an aromatic solvent at 80° to 180° C. in the presence of an aqueous alkali solution and a surface-active compound.

4,617,404

PROCESS FOR PREPARING STABILIZERS CONTAINING SULFUR AND A HINDERED PHENOL GROUP

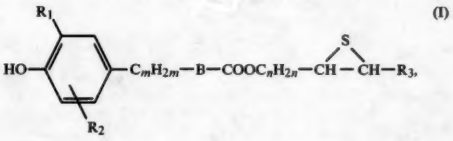
David H. Steinberg, New York, and Frank Cortolano, Valhalla, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 9, 1985, Ser. No. 773,723

Int. Cl.[4] C07D *327/02;* C10G *7/02*

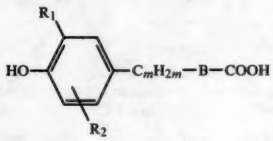
U.S. Cl. 549—90 **12 Claims**

1. A process for the production of compounds having the formula I



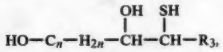
(I)

in which R_1 and R_2, independently, denote alkyl with 1 to 6 carbon atoms, cycloalkyl with 5 to 8 carbon atoms, allyl, methallyl, aralkyl with 5 to 9 carbon atoms, phenyl, 1- or 2-naphthyl or alkaryl with 7 to 9 carbon atoms, R_2 moreover also denotes hydrogen, R_3 denotes hydrogen, alkyl with 1 to 6 carbon atoms, unsubstituted phenyl or phenyl substituted by chlorine, methyl or chlorine and methyl, B is a hetero atom, the group —OC(O)—, —OC(O)—CH_2CH_2—, or a direct bond, m is an integer from 0 to 6, and n is an integer from 1 to 6, which comprises reacting a compound of the formula II



(II)

with a thioglycerol of the formula III



(III)

wherein R_1, R_2, R_3, B, m and n are as defined above, in the presence of a catalytic amount of an acid.

4,617,405

PREPARATION OF ALPHA, BETA-UNSATURATED CARBONYL COMPOUNDS

Donald E. Kiely, Birmingham, Ala., and Martin Seidman, Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Sep. 25, 1984, Ser. No. 654,811

Int. Cl.[4] C07D *307/60;* C07C *35/06*

U.S. Cl. 549—262 **8 Claims**

1. A process for preparing alpha, beta-unsaturated carbonyl compounds which comprises:

(a) reacting an acid anhydride selected from the group consisting of glutaric anhydride and 3-methylglutaric anhydride with a beta-hydroxy carbonyl compound having the following chemical formula:

$R_2COH—CHR—CRO$ or $R_2COH—CHR—CN$

where each R is any substituent group, in the presence of a catalytically effective amount of an acid catalyst to form an ester;

(b) reacting the ester in the presence of a catalytically effec-

tive amount of a base catalyst to form an alpha, beta-unsaturated carbonyl compound and a carboxylic acid;
(c) separating the alpha, beta-unsaturated carbonyl compound and the carboxylic acid;
(d) heating the carboxylic acid at a temperature of about 100° to 250° C. and at a pressure less than about 50 mm mercury to form the corresponding acid anhydride and water; and
(e) isolating and recycling the acid anhydride.

4,617,406

PURIFICATION OF TOCOPHEROLS

Stephen M. Willging, Minneapolis, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

Filed Feb. 11, 1985, Ser. No. 700,416
Int. Cl.⁴ C07D *311/72*
U.S. Cl. 549—413 **8 Claims**

1. A process for the purification of tocopherol comprising:
(a) reacting the tocopherol in a tocopherol-containing feed material with a member selected from the group consisting of: boric acid, an alkoxy boroxine, an alkoxy borate, a phenoxyboroxine, and a phenoxyborate to form a borate tocopherol ester;
(b) distilling the product of (a) to leave the borate tocopherol esters in the residue;
(c) releasing the tocopherol from the borate tocopherol ester left after distillation by reacting the borate tocopherol ester with a member selected from the group consisting of: water, methanol and ethanol to form the tocopherol and a boron compound;
(d) removing the boron compound formed by the reaction of the water, methanol and ethanol in step (c), and then
(e) recovering the released tocopherol after step (d).

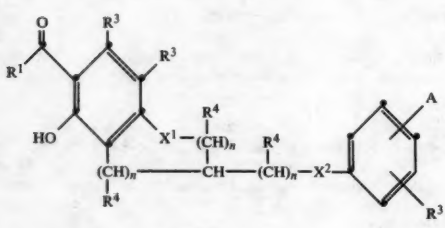
4,617,407

LEUKOTRIENE ANTAGONISTS

Robert N. Young, Senneville, and Joshua Rokach, Laval, both of Canada, assignors to Merck Frosst Canada, Inc., Kirkland, Canada

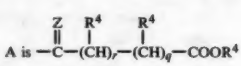
Filed Aug. 30, 1984, Ser. No. 645,595
Int. Cl.⁴ C07D *307/88, 311/04*
U.S. Cl. 549—462 **3 Claims**

1. Compounds having the formula:



I

and the pharmaceutically acceptable salts and acid addition salts thereof, wherein:
each n is independently 0 or 1;
X^1 is O;
X^2 is O or S;



wherein
Z is O or H/H;
r and q are each independently 0 to 2;
R^1 is alkyl of 1 to 6 carbon atoms which may be straight chain or branched;
each R^3 is independently H or alkyl of 1 to 6 carbon atoms which may be straight chain or branched; and
each R^4 is independently H or alkyl of 1 to 6 carbon atoms which may be straight chain or branched.

4,617,408

MODIFIED TITANIUM (IV) ACETYLACETONATES

Heinz Nestler, Troisdorf-Eschmar, and Dieter Barfurth, Troisdorf-Spich, both of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Cologne, Fed. Rep. of Germany

Filed Mar. 18, 1985, Ser. No. 713,302
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1984, 3424189; Jul. 23, 1984, 3427064
Int. Cl.⁴ C07F *7/28*
U.S. Cl. 556—40 **10 Claims**

1. A dialkoxy titanium(IV) acetylacetonate chelate containing 0.05 to 0.75 moles of a malonic acid dialkyl ester moiety per gram-atom of titanium, the malonic acid dialkyl ester moiety being of the formulas ROOC—CR′R′—COOR, or $(ROOC)_2C{=}CH{-}OR$ wherein R represents alike or different alkyl moieties of 1 to 4 carbon atoms, and R′ represents H or R.

4,617,409

AMINOMETHYLTRIORGANOTIN COMPOUNDS, PREFERABLY α-MONO OR DISUBSTITUTED; AND THE METHOD OF PREPARATION

Bernard Elissando; Michel Pereyre, both of Talence, and Jean-Paul Quintard, Gradignan, all of France, assignors to Centre National de la Recherche Scientifique, France

Filed Jun. 29, 1984, Ser. No. 626,158
Int. Cl.⁴ C07F *7/22*
U.S. Cl. 556—87 **14 Claims**

1. Aminomethyltriorganotin compounds selected from the group consisting of mono and disubstituted in position α, having the following chemical formula:

$$R_3Sn{-}CR^1R^2NR^3R^4$$

wherein R^1, R^2 each independently represents hydrogen with the proviso that at least one of R^1, R^2 is other than hydrogen; R, R^1, R^2, R^3, R^4 each independently represents any organic radical, saturated or unsaturated, aliphatic or alicyclic, having from 1 to 20 carbon atoms; or any two radicals taken together can form a ring which is saturated or unsaturated.

4,617,410

PROCESS FOR THE PRODUCTION OF PURE CIS-PLATINUM-(II)-IDIAMMINE DICHLORIDE

Bernhard Lippert, Garching, and Gabriele Raudaschl, Bayerisch Gmain, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 13, 1984, Ser. No. 579,646
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1983, 3305248
Int. Cl.⁴ C07F *15/00*
U.S. Cl. 556—137 **16 Claims**

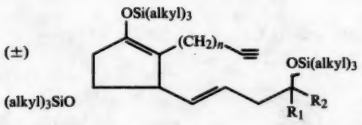
1. A process for the production of pure cis-platinum-(II)-diammine dichloride comprising reacting impure cis-platinum-(II)-diammine dihydrochloride with N,N-dimethylformamide to form an adduct of the cis-platinum(II) and the N,N-dimethylformamide of the formula $Pt(NH_3)_2Cl_2.C_3H_7NO$, precipitating the adduct and subsequently removing the N,N-dimethylformamide to recover purified cis-platinum-(II)-diammine dichloride.

4,617,411
3-OXAPROSTAGLANDINS

Paul W. Collins, Deerfield, and Richard M. Weier, Lake Bluff, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Division of Ser. No. 558,471, Dec. 6, 1983, Pat. No. 4,529,812.
This application Mar. 25, 1985, Ser. No. 715,445
Int. Cl.[4] C07F *7/18*
U.S. Cl. 556—443 **2 Claims**

1. An Intermediate compound of the formula:



wherein n is an integer of from 1 to 6 inclusive, wherein R_1 is:
(a) hydrogen;
(b) alkyl of 1 to 6 carbon atoms, inclusive;
(c) trifluoromethyl;
(d) trichloromethyl;
(e) alkenyl; or
(f) alkynyl;
wherein R_2 is straight chain alkyl of 1 to 6 carbon atoms inclusive.

4,617,412
TRANSETHERIFICATION PROCESS

Michael J. Green, Hull, and Gerhard A. Kleiner, London, both of England, assignors to BP Chemicals Limited, London, England

Filed Jan. 29, 1985, Ser. No. 696,031
Claims priority, application United Kingdom, Feb. 4, 1984, 8402996; Apr. 5, 1984, 8408805
Int. Cl.[4] C07F *7/08, 7/18*
U.S. Cl. 556—446 **22 Claims**

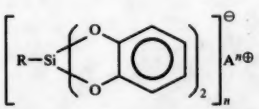
1. A process for the transetherification of silyl ethers characterised in that a silyl ether and a hydroxyl containing compound are reacted together in the presence of a Lewis base contaiing catalyst,
wherein said catalyst is selected from the group consisting of
(1) an amidine, or a guanidine,
(2) a Lewis base in the presence of an epoxide, and
(3) a trivalent organophosphorus compound in the presence of an activated alkene or alkyne.

4,617,413
PENTACOORDINATE SILICON COMPLEXES, THE PROCESS FOR THEIR PREPARATION AND THEIR APPLICATION TO THE PREPARATION OF ORGANOSILANES

Robert J. Corriu; Geneviève E. Cerveau, both of Montpellier; Claude G. Chuit, Palavas les Flots, and Catherine Reye, Montpellier, all of France, assignors to Centre National de la Recherche Scientifique, Paris, France

Filed Dec. 24, 1985, Ser. No. 813,740
Claims priority, application France, Dec. 27, 1984, 84 19885
Int. Cl.[4] C07F *7/08, 7/18*
U.S. Cl. 556—464 **13 Claims**

1. A pentacoordinate silicon complex which corresponds to the general formula I:



(I)

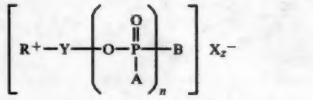
in which:
R denotes an alkyl, alkenyl, alkynyl, aryl, aralkyl, aralkenyl, aralkynyl or alkylaryl radical in which the aliphatic fragments are linear, branched or cyclic and contain from 1 to 20 carbon atoms,
A represents an alkali metal or alkaline earth metal, with the proviso however that A represents neither sodium nor potassium when R is a phenyl radical, and
n=1 or 2.

4,617,414
PROCESS FOR THE PREPARATION OF PHOSPHATE SURFACTANTS

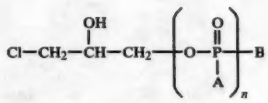
Elvin R. Lukenbach, Somerset, and Richard R. Tenore, Martinsville, both of N.J., assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Filed Sep. 10, 1984, Ser. No. 649,031
Int. Cl.[4] C07F *9/08;* C11C *3/00*
U.S. Cl. 558—87 **4 Claims**

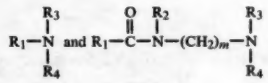
1. In a process for the preparation of phosphate compounds of the formula



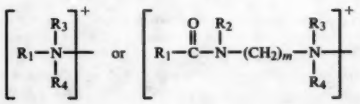
comprising the steps of
(1) reacting an inorganic phosphate salt with epichlorohydrin to obtain a phosphate ester of the formula



(2) reacting the phosphate ester with a substituted amine selected from the group consisting of



wherein
A is selected from O—, OM and O—Y—R^+;
B is selected from O—, OM and H;
X is an anion;
n is an integer of 1 or 2;
z is an integer from 0 to 3 as required for charge balance;
m is an integer of from 2 to 12;
Y is alkylene or substituted alkylene;
M is hydrogen, an organic radical selected from alkyl or hydroxyalkyl of up to 6 carbon atoms, polyhydroxyalkyl of up to 10 carbon atoms, glyceryl, cycloalkyl of up to 6 carbon atoms, aryl or arylalkyl of up to 10 carbon atoms, or a salt radical;
R is an amine or an amidoamine moiety of the formula



R_1 is an alkyl, alkenyl, alkoxy, or hydroxyalkyl of from 5 to 22 l carbon atoms each, or aryl or alkaryl of up to 20 carbon atoms;

R_2 is hydrogen or alkyl, hydroxyalkyl or alkenyl of up to 6 carbon atoms each or cycloalkyl of up to 6 carbon atoms, or polyoxyalkylene of up to 10 carbon atoms;

R_3 and R_4 are the same or different and are selected from alkyl, hydroxyalkyl, carboxyalkyl of up to 6 carbon atoms in each alkyl moiety, and polyoxyalkylene of up to 10 carbon atoms; and in addition, R_3 and R_4 taken together with the nitrogen to which they are attached, may represent an N-heterocycle, in which the Y radical is bonded to a ring atom of said N-heterocycle other than the nitrogen of the R moiety;

and wherein the improvement comprises carrying out step (1) of the process at a pH of from about 5.4 to 7.0.

4,617,415

α-SUBSTITUTED N-PHOSPHONOMETHYLIMINODIACETIC ACID

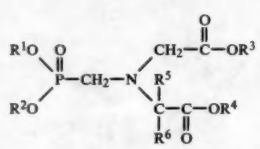
Terry M. Balthazor, University City, and Mitchell J. Pulwer, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 557,727, Dec. 2, 1983. This application Jun. 10, 1985, Ser. No. 743,213

Int. Cl.[4] C07F *9/40*

U.S. Cl. 558—169 **2 Claims**

1. A compound corresponding to the formula



where R^1, R^2, R^3, and R^4 are independently selected from the group consisting of hydrogen, lower alkyl, aryl, and a salt-forming cation, and R^5 and R^6 are independently selected from the group consisting of hydrogen, alkyl, aryl, substituted alkyl, and substituted aryl, not more than one of R^5 and R^6 being hydrogen.

4,617,416

PROCESS FOR THE PREPARATION OF THIOCARBAMATES

Renato Ugo, Milan; Stefano Campolmi, Novara, and Vittorio Carletti, Meda, all of Italy, assignors to Montedison S.p.A., Milan, Italy

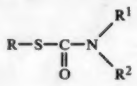
Filed Mar. 19, 1985, Ser. No. 713,603

Claims priority, application Italy, Mar. 22, 1984, 20174 A/84

Int. Cl.[4] C07C *155/02*

U.S. Cl. 558—242 **6 Claims**

1. A process for the preparation of thiocarbamates having general formula:



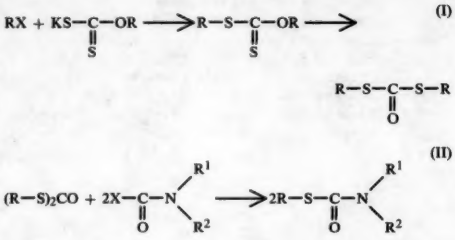
(A)

wherein:

R represents an alkyl C_1–C_4 optionally substituted with one or more halogen atoms, an alkenyl C_2–C_4 optionally substituted with one or more halogen atoms, a phenyl optionally substituted with one or more halogen atoms, a benzyl optionally substituted on the phenyl ring with one or more halogen atoms;

R^1 and R^2, equal or different from one another, represent an alkyl C_1–C_4; a cycloalkyl,

according to the following reactions (I) and (II):



(I)

(II)

wherein X is a halogen; R, R^1 and R^2 have the same meanings as in general formula (A), reactions (I) and (II) being carried out in sequence without isolation of intermediate products, in alkaline aqueous-organic medium, in the presence of a phase transfer catalyst with xanthogenate/catalyst molar ratios of 20:1 to 10:1 and alkaline base/xanthogenate molar ratios of 4:1 to 10:1.

4,617,417

ALKYL 2-CARBOALKOXY-3,4-DIALKOXYBENZENECARBAMATES AND PROCESS FOR THEIR PREPARATION

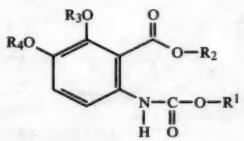
Richard A. Conley, Annandale, and Donald L. Barton, Frenchtown, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Jul. 29, 1985, Ser. No. 759,975

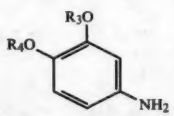
Int. Cl.[4] C07C *125/065*

U.S. Cl. 560—29 **12 Claims**

1. A process for preparing a compound of the formula



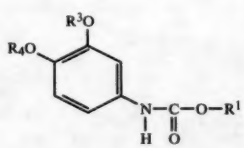
which comprises reacting a compound of the formula



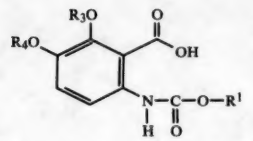
with an alkyl carbonate of the formula

R_1OCOR_5

to form a 3,4-dialkoxybenzenecarbamate of the formula

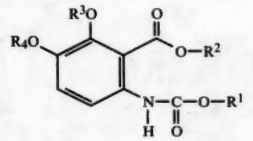


reacting the carbamate with an organolithium reagent and then reacting the product formed with carbon dioxide to form an acid of the formula



and reacting the acid with an esterifying agent, wherein R, R_1, R_2, R_3 and R_4 are lower alkyl and R_5 is chloro, bromo, OR or OCOOR wherein R is lower alkyl.

6. A compound of the formula



wherein R_3 and R_4 are lower alkyl; R_1 is straight or branched chain lower alkyl; and R_2 is hydrogen or lower alkyl.

4,617,418

POLYALKYLENE POLYAMINES VIA VAPOR PHASE REACTION

Michael E. Ford, Center Valley, and Thomas A. Johnson, Orefield, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Nov. 26, 1984, Ser. No. 674,611

The portion of the term of this patent subsequent to Jul. 31, 2001, has been disclaimed.

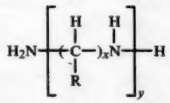
Int. Cl.[4] C07C *85/06*

U.S. Cl. 564—479 **29 Claims**

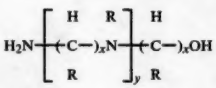
1. In a process for preparing a noncyclic polyalkylene polyamine which comprises contacting:

(a) ammonia,

(b) an alkyleneamine compound having two primary amino groups of the general formula:



wherein R is hydrogen or a lower alkyl (C_1–C_4) radical, x is a number from 2 to about 6, and y is a number from 1 to about 4, and (C) an alkanolamine compound having primary or secondary hydroxyl groups of the general formula:



wherein R is hydrogen or a lower alkyl (C_1–C_4) radical, x is a number from 2 to about 6, and y is a number from 0 to about 3; in the presence of an effective amount of an acidic catalyst and at a reaction temperature and reaction pressure sufficient to effect reaction between the ammonia, alkanolamine compound, and the alkyleneamine compound, the improvement for effecting said reaction under vapor phase conditions while maintaining high selectivity which comprises:

establishing a reaction zone containing a catalytic bed comprising a solid phase acidic catalyst;

contacting said bed with reactant ammonia, alkanolamine compound and alkyleneamine, and

maintaining sufficient ammonia in the reaction zone such that the dew point temperature of the reactor contents is below the reaction temperature at reaction pressure.

4,617,419

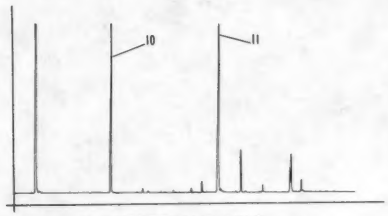
PROCESS FOR PREPARING NATURAL BENZALDEHYDE AND ACETALDEHYDE, NATURAL BENZALDEHYDE AND ACETALDEHYDE COMPOSITIONS, PRODUCTS PRODUCED THEREBY AND ORGANOLEPTIC UTILITIES THEREFOR

Charles Wiener, Middletown, and Alan O. Pittet, Atlantic Highlands, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Sep. 26, 1985, Ser. No. 780,298

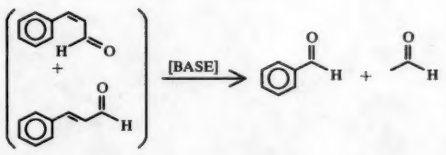
Int. Cl.[4] C07C *45/72*

U.S. Cl. 568—464 **8 Claims**



GC-IR SPECTRUM FOR EXAMPLE I

1. A process for preparing a composition of matter containing a substantial quantity of a natural benzaldehyde and/or acetaldehyde comprising the step of carrying out a retro-aldol reaction on naturally occurring cinnamaldehyde in the presence of base and an inert solvent and in the absence of any other reagents according to the reaction:



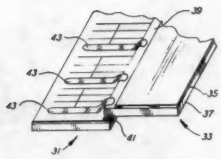
the reaction being carried out at from about 0.2 up to about 10 atmospheres; at a temperature of from about 40° C. up to about 150° C. and for a period of time of from about 5 hours up to 80 hours; the base being selected from the group consisting of sodium carbonate, sodium bicarbonate, potassium carbonate, potassium bicarbonate, lithium carbonate, lithium bicarbonate, proline, choline, magnesium hydroxide, calcium hydroxide, magnesium carbonate, calcium carbonate and mixtures of lecithin and base; the inert solvent being a C_1–C_5 lower alkanol or water.

4,617,420

FLEXIBLE, INTERCONNECTED ARRAY OF AMORPHOUS SEMICONDUCTOR PHOTOVOLTAIC CELLS

David A. Dilts, Gates Mills, and Timothy W. Brauneck, Thompson, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jun. 28, 1985, Ser. No. 749,832
Int. Cl.[4] H01L *25/02, 31/18*
U.S. Cl. 136—244 13 Claims



1. A flexible interconnected array of solar cells, comprising at least two strips of photoelectric cells, each of said strips having a width and a length, said length being longer than said width, and including an electrically conductive substrate for forming one electrode of said array, said substrate having opposed top and bottom surfaces, a photoresponsive semiconductor body disposed on one surface of said substrate, and a transparent conductive coating disposed on said semiconductor body opposite said substrate, a portion of the bottom surface of the substrate of one strip overlapping a portion of the coating on an adjacent, overlapped strip along the lengths of said overlapping and overlapped strips, said strips being flexibly joined in their mutually overlapping portions by a length of a flexible plastic adhered to the bottom surface of the substrate of said overlapping strip and to the coating of said adjacent overlapped strip, and wherein said substrate of said overlapping strip is free of said semiconductor body along the margin of its length overlapping said adjacent overlapped strip and at least one conducting stripe is disposed on said coating of said overlapped strip along its width, continuously extending to and contacting said margin of said overlapping strip to interconnect said strips electrically.

4,617,421

PHOTOVOLTAIC CELL HAVING INCREASED ACTIVE AREA AND METHOD FOR PRODUCING SAME

Prem Nath, Rochester; Masatsugu Izu, Birmingham; Herbert C. Ovshinsky, Oak Park, and Avtar Singh, Detroit, all of Mich., assignors to Sovonics Solar Systems, Troy, Mich.

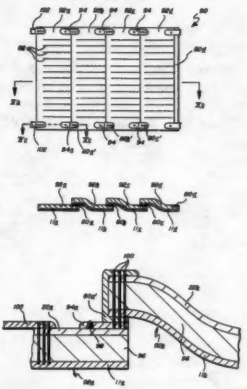
Filed Apr. 1, 1985, Ser. No. 718,970
Int. Cl.[4] H01L *25/02, 31/18*
U.S. Cl. 136—244 28 Claims

1. An improved large area, flexible photovoltaic device, said device comprised of a plurality of electrically interconnected smaller area photovoltaic cells, each of said smaller cells including:

a flexible substrate member having at least one electrically conductive base electrode region thereupon, a semiconductor body disposed upon said substrate in electrical communication with said base electrode region, and at least one relatively transparent top electrode member disposed upon the semiconductor body, said base electrode region, said semiconductor body and said top electrode member cooperating to provide at least one photovoltaic region in each of said smaller area cells for absorbing incident light and generating electrical current in response thereto;

said smaller area cells including a discrete, elongated electrically conductive bus bar disposed proximate substantially the entire length of a first edge thereof, in electrical communication with said top electrode member, for conveying said electrical current to at least one collection point proximate at least a second edge thereof;

said smaller area cells disposed in overlapping relationship so that the bus bar of at least one of said cells is disposed beneath the substrate of an adjacent cell; said device further including means for electrically interconnecting the



bus bar of one cell with one of the electrodes of the adjacent cell at said at least one collection point only, whereby said cells are electrically interconnected, the surface of the large area photovoltaic device available for the generation of electrical current is maximized and flexibility of the device in the direction transverse to said elongated, electrically conductive bus bars is retained.

4,617,422

ELECTRIC CABLES AND COMPOSITIONS FOR USE IN THEM

John M. R. Hagger, Twickenham, Great Britain, assignor to BICC Public Limited Company, London, England

Division of Ser. No. 504,318, Jun. 14, 1983, abandoned, which is a continuation-in-part of Ser. No. 335,074, Dec. 28, 1981, abandoned. This application Dec. 3, 1984, Ser. No. 676,612
Claims priority, application United Kingdom, Jan. 30, 1981, 8012849
Int. Cl.[4] H02G *15/20*
U.S. Cl. 174—23 C 10 Claims

1. A fully-filled telecommuncation cable comprising a plurality of metallic conductors each coated with cellular insulation and a sheath enclosing said conductors and containing a filling medium comprising (by weight):

(a) 70–98% of a hydrocarbon base comprising:

(i) a first component which is selected from the group consisting of mineral oils, petroleum jellies and mixtures of mineral oil with wax;

(ii) a second component which is soluble in the first component and which comprises at least one hydrocarbon whose molecules are substantially incapable of diffusing into polyethylene, polypropylene and other cellular insulating material at temperatures of up to 80° C., its number average molecular weight being low enough and its quantity sufficient to establish an osmotic pressure relative to that of the first component as solvent, which is effective to inhibit migration of said first component into cells of said cellular insulation;

(b) 1–15% of a block copolymer which comprises a main polymer chain made up of repeating units of at least two kinds covalently bonded together, said repeating units being non-randomly distributed along the length of said chain in such a way as to divide said chain into at least one

block tending to confer solubility in the base and at least one block tending to inhibit such solubility, the proportions of the blocks being such that the polymer forms a gel with the base; and

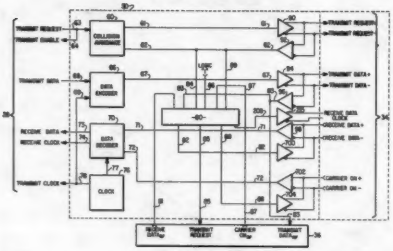
(c) 1-15% of a hydrocarbon material that is miscible with said base and said block copolymer above 135° C. but forms solid dispersed particles at a temperature not lower than 65° C.

4,617,423

DATA COMMUNICATION SYSTEM

James W. Dickerson, Plano, and William N. Smith, III, Carrollton, both of Tex., assignors to AGILE Systems, Carrollton, Tex.

Filed Sep. 4, 1984, Ser. No. 646,741
Int. Cl.[4] H04L *15/00*
U.S. Cl. 178—2 R **12 Claims**



1. A network multiple physical layer interface connected to a communcations network of a first physical layer type and a second physical layer type, each layer type including a send channel and a receive channel, said interface comprising:

a first circuit means for receiving data from said first physical layer send channel and receive channel and simultaneously transmitting said data to said second physical layer send channel and received channel respectively;

a second circuit means for receiving data from said second physical layer send channel and receive channel and simultaneously transmitting said data on said first physical layer send channel and receive channel respectively;

a third circuit means for receiving data from one of the send channels and transmitting the data to one of the receive channels;

means for transmitting and receiving data from, said first physical layer send channel and receive channel and simultaneously transmitting and receiving data through a MODEM to said second physical layer send channel and receive channel; and

a data terminal and a network collision avoidance means operatively connected to the data terminal for preventing transmission of data from said data terminal when information traffic is present on the first and second physical layers.

4,617,424

SYSTEM FOR PREVENTING STEALING OF LINE IN RADIOTELEPHONY

Nobuhiro Tatsuta, Gunma, Japan, assignor to Sanyo Electric Co., Ltd. and Tokyo Sanyo Electric Co., Ltd., both of, Japan

Filed May 9, 1984, Ser. No. 608,464
Claims priority, application Japan, May 30, 1983, 58-96500
Int. Cl.[4] H01Q *7/04*
U.S. Cl. 179—2 EA **14 Claims**

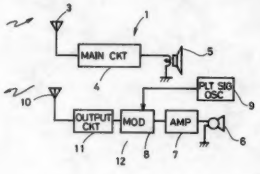
1. A system for preventing stealing of the line in radiotelephony having a master telephone set and a subsidiary telephone set making reception and transmission of radio signals therebetween, said master telephone set being connected to a telephone line in response to a pilot signal from said subsidiary telephone set, wherein

said subsidiary telephone set comprises:

pilot signal generating means for generating a first pilot signal having a first frequency and a second pilot signal having a second frequency, said second pilot signal following said first pilot signal; and

transmitting means for modulating a carrier wave signal by at least said first and second pilot signals and transmitting the modulated signal to said master telephone set; and

said master telephone set comprises:



receiving means for receiving and demodulating at least said first and second pilot signals from said subsidiary telephone set;

pilot signal detecting means connected to said receiving means for detecting whether said first pilot signal and said second pilot signal are successively received; and

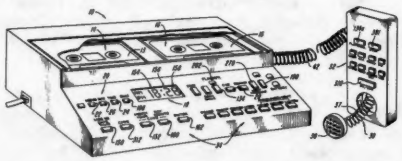
connecting means coupled to said pilot signal detecting means for connecting said receiving means to said telephone line in response to detection by said pilot signal detecting means of said successive reception of said first pilot signal and said second pilot signal.

4,617,425

TELEPHONE ANSWERING DEVICE

Keiichi Nakamura, Tama, and Hideyuki Horiuchi, Tokyo, both of Japan, assignors to Tandy Corporation, Fort Worth, Tex.

Division of Ser. No. 324,154, Nov. 23, 1981, Pat. No. 4,469,919.
This application Aug. 24, 1984, Ser. No. 632,484
Claims priority, application Japan, Feb. 20, 1981, 56-23928; Feb. 20, 1981, 56-23929; Feb. 20, 1981, 56-23930; Feb. 20, 1981, 56-23931; Mar. 23, 1981, 56-41893; Mar. 23, 1981, 56-41894; Mar. 31, 1981, 56-47688
Int. Cl.[4] H04M *1/64*
U.S. Cl. 179—6.11 **12 Claims**



1. A telephone answering system comprising:

a telephone answering device for answering a telephone, said answering device having a plurality of function means for performing a plurality of functions of the answering device and processor means for controlling the plurality of function means;

a remote control unit for use with a telephone for controlling the operation of the telephone answering device from a remote location, said remote control unit having a plurality of user manipulable input switches, each of which corresponds to a particular function of the answering device, means responsive to a closed function switch for generating a multi-bit digital code corresponding uniquely to said closed function switch, means for generating at least one tone having a single frequency, means responsive

to said digital code for encoding each bit of said code with said tone to produce a sequential time series of tone signals, and means responsive to said tone signals for transmitting said time series of tone signals over a telephone line to the answering device;

said answering device processor means further having means responsive to said time series of tone signals for demodulating said series of tone signals to reproduce said digital code signal from the remote control unit to determine the particular remote control function switch that was closed and controlling the particular function means in accordance with the reproduced digital signal.

4,617,426

METHOD FOR CURRENT SUPPLY TO A SUBSCRIBER TELEPHONE FROM A TELEPHONE EXCHANGE

Jan H. Johansson, Bålsta, and Nils J. Sundvall, Lidingö, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

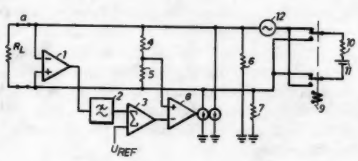
PCT No. PCT/SE83/00242, § 371 Date Mar. 6, 1984, § 102(e) Date Mar. 6, 1984, PCT Pub. No. WO84/00459, PCT Pub. Date Feb. 2, 1984

PCT Filed Jun. 14, 1983, Ser. No. 598,322

Claims priority, application Sweden, Jul. 6, 1982, 8204185

Int. Cl.[4] H04M *19/00*

U.S. Cl. 179—16 AA **2 Claims**



1. In a telephone system wherein current is fed from a voltage source in a telephone exchange to first and second terminals of a subscriber line circuit with a load, the method of maintaining the potential of the first terminal at a constant mean value simultaneously as the potential of the second terminal is given a mean value which is dependent on the load comprising the steps of sensing the potential differences across the terminals, low-pass filtering the sensed potential difference to obtain a low-pass filter voltage, adding a reference voltage to said filtered voltage to obtain a reference value, said reference voltage being a measure of the constant mean value of said first terminal, generating another voltage related to the potentials of both terminals to form an actual value, generating a control voltage related to said reference and actual values, and current tapping in the same phase from both of said terminals in accordance with the amplitude of said control voltage.

4,617,427

SQUARE ROOT CIRCUIT

Mathew P. Vea, Pittsburgh, Pa., and Vinita Gupta, Menlo Park, Calif., assignors to Northern Telecom Limited, Montreal, Canada

Filed Feb. 13, 1985, Ser. No. 701,288

Int. Cl.[4] H04M *1/50*; G06F *15/31*

U.S. Cl. 179—84 VF **6 Claims**

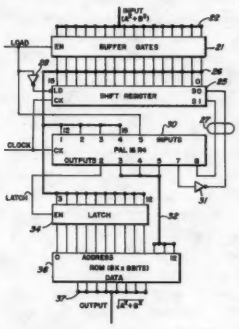
1. A number conversion circuit which includes a look-up means for providing an output number representing a predetermined function of an input binary number having n bits, the number conversion circuit comprising:

a shift register for capturing the n bits of the input binary number at corresponding ones of n register stages, the shift register being controllable to serially shift the bits of the captured binary number in directions of greater and lesser significance to provide a registered binary number;

logic means being connected to control the shift register in response to the content thereof such that:

(a) in a first case wherein any of m most significant stages is asserted, the binary number is shifted in the direction of lesser significance until each of the m most significant stages is unasserted; and

(b) in a second case wherein none of m+1 most significant stages is asserted, the binary number is shifted in the direction of greater significance until the $(n-m-1)^{th}$ most significant stage becomes asserted or until a predetermined limit number of shifts has occurred,



the logic means also being for providing a plural bit shift record in coincidence with the registered binary number;

the look-up means including an address port being connected to the shift register and to the logic means for being addressed by the plural bit shift record in combination with the binary number as it is ultimately registered in three stages of the shift register being bounded by and including the $(n-m-1)^{th}$ most significant stage and the least significant stage corresponding to the predetermined limit number,

whereby the address applied at the address port consists of fewer than said n bits.

4,617,428

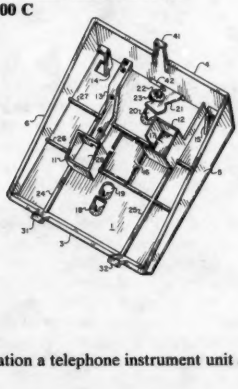
TELEPHONE BASE ADAPTED TO FACILITATE BOTH DESK AND WALL MOUNTING OF TELEPHONE INSTRUMENT

Babulal V. Gala, and Gerald B. McGough, both of Huntsville, Ala., assignors to GTE Communication Systems Corp., Northlake, Ill.

Filed Oct. 10, 1984, Ser. No. 659,398

Int. Cl.[4] H04M *1/02*

U.S. Cl. 179—100 C **15 Claims**



1. In combination a telephone instrument unit adapted to be

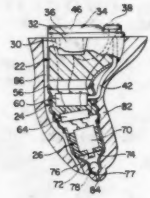
positioned in a horizontal first mode and alternatively positioned in a vertical second mode, said unit including a line cord plug receiving jack and at least a first and a second connector receiving means mounted in a bottom portion of said unit, a line cord including a plug mounted on both ends thereof and an adaptor unit connectible to said bottom portion, said adapter unit comprising: first and second end walls parallel to each other; a first connector included in said first end wall, in said horizontal first mode engaging said first connector receiving means and alternatively in said vertical second mode engaging said second connector receiving means; a second connector included in said second end wall, in said horizontal first mode engaging said second connector receiving means and alternatively in said vertical second mode engaging said first connector receiving means; a first and a second side wall each parallel to each other and each perpendicular to said end walls; and a bottom connected to said end walls and to said side walls and including therein at least a first passageway providing manual access to said line cord plug receiving jack; said bottom also including stud receiving means adapted to engage studs associated with a wall telephone mounting jack whereby said adaptor unit and said telephone unit connectible thereto may be positioned adjacent to said wall mounted jack in a vertical position when said connectors are engaged in said vertical second mode; said bottom further including a second passageway providing manual access to said line cord plug receiving jack when said telephone is mounted in said second vertical mode; said first passageway providing manual access to said line cord plug receiving jack when said instrument is mounted to said adaptor unit in said horizontal first mode; and said adaptor unit bottom still further including therein a plurality of removable sections.

4,617,429

HEARING AID

Gaspare Bellafiore, 58 Stevens Rd., Cranston, R.I. 02910

Filed Feb. 4, 1985, Ser. No. 698,072
Int. Cl.[4] H04R *25/02*; B29C *33/40*
U.S. Cl. 179—107 E **7 Claims**



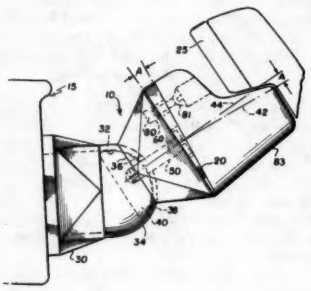
1. A hearing aid for insertion into the auditory canal of a user and having a plurality of components mounted therein, said hearing aid further comprising an outer shell that defines a plug that has an exterior configuration that has been preshaped to snugly fit into the auditory canal of the user's ear, an assembly including an outer member, an intermediate member and an innter member in which said components are mounted, said outer, intermediate, and inner members being pre-assembled together prior to being fixed in said shell and being interfitted together such that the connecting portions of the members are initially pivotally movable relative to each other to pre-shape the assembly into a configuration that generally corresponds to the configuration of the auditory canal of the user, and said outer shell being formed around said preshaped assembly to embed said assembly therein.

4,617,430

SWIVEL MOUNT

David V. Bryant, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Apr. 19, 1984, Ser. No. 601,931
Int. Cl.[4] H04M *1/04, 1/12*; A47F *5/08*
U.S. Cl. 179—146 R **7 Claims**



1. A swivel mount, comprising:

three separate elements including (1) a base element having a projecting convex spherical surface and a mating concentric interior spherical cavity with an aperture extending therethrough to said projecting convex spherical surface, (2) a mounting element having a concave spherical depression surface matching said projecting convex spherical surface of the base element and (3) a spherical element matingly housed within said interior spherical cavity of the base element;

means, passing through said aperture in said base element, (1) for engaging said mounting element and said spherical element and (2) for permitting selective movements of said mounting element toward said spherical element to thereby selectively secure said three elements into a selected orientation with respect to each other;

said mounting element including mounting holes therein for attaching a device thereto; and

said mounting element and said spherical element being movable in tandem relative to said base element when engaged though not secured by said means.

4,617,431

VOICE TUBE ASSEMBLIES FOR POST-AURICLE HEADSETS

Charles G. Scott, and Robert L. Harris, both of Aptos, Calif., assignors to Plantronics, Inc., Santa Cruz, Calif.

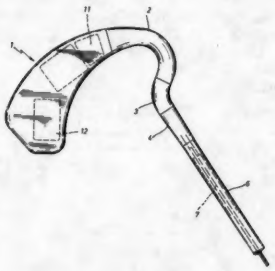
Filed Dec. 2, 1983, Ser. No. 557,432
Int. Cl.[4] H04M *1/05*
U.S. Cl. 179—156 A **5 Claims**

1. A voice tube assembly for a communications headset including a post-auricle capsule, comprising

(a) a first curved, relatively rigid tubing section, adapted for connection and rotation relative to said post-auricle capsule;

(b) a second curved, relatively rigid tubing section rotatably connected to said first tubing section; said first tubing

section being adapted to hang over a wearer's ear and said first and second tubing sections being adjustable to substantially conform to a wearer's head and ear and adapted to convey voice signals into said capsule.

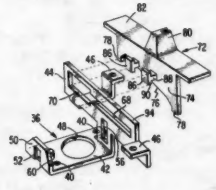


4,617,432

ADJUSTABLE PRESSURE RESPONSIVE SWITCH ASSEMBLY

Tore B. Hanssen, and Abed G. Kahale, both of Hoffman Estates, Ill., assignors to Controls Company of America, Schiller Park, Ill.

Filed May 3, 1985, Ser. No. 730,010
Int. Cl.[4] H01H *35/34*
U.S. Cl. 200—81 R **3 Claims**



1. An adjustable pressure responsive switch assembly comprising:

a pressure actuated switch mechanism;

an adjustable element in said switch mechanism for effectively varying the relative pressure at which said switch mechanism will actuate;

bracket structure supporting said switch mechanism, said bracket structure including a planar piece having an elongated open slot therein;

a unitary slider member including cam means for engaging with and effecting movement of said adjustable element to vary the adjustment of said switch mechanism as said slider member is moved, said slider member being formed with stop means at each end of said cam means for engaging said adjustable element at the extremes of the normal range of travel of said cam means with respect to said adjustable member so as to prevent travel of said slider member beyond the normal range when the assembly is complete; and

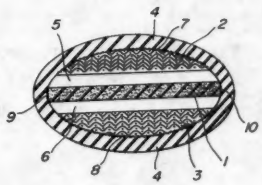
means mounting said unitary slider member on said bracket structure including means projecting through said slot and attached to said slider member, said projecting means being formed as a unitary part of said slider member and including a stem portion and an enlarged head portion, said slot having an enlarged region through which said head portion is inserted, said enlarged region being outside the normal range of travel of said projecting means along said slot.

4,617,433

PRESSURE-SENSITIVE CONDUCTIVE STRIP SWITCH ASSEMBLY AND A METHOD OF MANUFACTURING THE SAME

Kyofu Hoshikawa; Seishiro Ishiwatari, and Mitsuru Tanahashi, all of Tokyo, Japan, assignors to Bridgestone Corporation and Shinmei Rubber Ind., Co., Ltd., both of, Japan

Filed Jun. 20, 1985, Ser. No. 746,691
Claims priority, application Japan, Jun. 25, 1984, 59-129172
Int. Cl.[4] H01H *3/16*
U.S. Cl. 200—86 R **2 Claims**



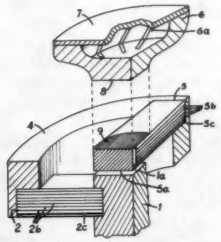
1. A pressure-sensitive conductive strip switch assembly comprising a strip-like pressure-sensitive conductive rubber based on silicone containing metal powder therein, a pair of strip-like plain woven metal wire cloths sandwiching the conductive rubber therebetween through space portions, and a rubber sheath covering them and made of heat-resistant silicone rubber, both side ends of the conductive rubber being welded to the inner wall of the rubber sheath, and only the outside of each of the metal wire cloths being edged into the inner wall of the rubber sheath.

4,617,434

CONTACT ARRANGEMENT FOR A VACUUM INTERRUPTER

Karl Zäckler, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

Filed Aug. 30, 1984, Ser. No. 646,435
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1983, 3332092
Int. Cl.[4] H01H *33/66*
U.S. Cl. 200—144 B **12 Claims**



1. A contact arrangement for a vacuum switch having an open and a closed position with two contact assemblies fixed to two contact rods moveable relative to one another to effect said open and closed positions, comprising:

at least one support arm as part of each said contact assembly, solidly connected on one end to its respective contact rod;

a contact jacket as part of each said contact assembly solidly connected to another end of its respective, at least one, support arm, each said contact jacket partially surrounding an end of each respective contact rod;

a contact arm as part of each said contact assembly solidly

connected at one end to its respective contact jacket, each said contact arm having an inner contact surface for electrically connecting with its respective contact rod end when in the closed position;

a contact body as part of each said contact assembly solidly connecting on an outer surface to each respective contact arm, each said contact body electrically connecting with the other contact body when said contact arrangement is in the closed position; and

each said support arm and each said contact arm having a high electrical conductivity and a high mechanical elasticity; said high mechanical elasticities of said support arms and said contact arms act as spring tensions during a change from the closed position to the open position causing each said contact rod end to separate from its respective contact arm, inner contact surface while the spring tensions keep the contact bodies together until subsequently the contact bodies move to the open position.

4,617,435

HYBRID CIRCUIT BREAKER

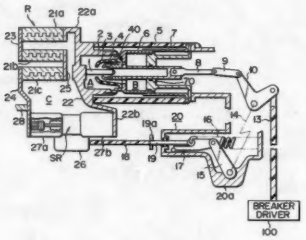
Yutaka Kawasaki, Miura, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 11, 1985, Ser. No. 753,777

Claims priority, application Japan, Aug. 28, 1984, 59-178643

Int. Cl.[4] H01H *33/16*

U.S. Cl. 200—144 AP **9 Claims**



1. A hybrid circuit breaker for interrupting a circuit current of an electric power system, comprising:

resistor means for damping or suppressing an overvoltage generated at said electric power system when said circuit current is interrupted;

first interrupter means for commutating said circuit current to said resistor means so that a resistor current corresponding to said circuit current flows through said resistor means;

second interrupter means coupled to said resistor means and to said first interrupter means for cutting-off said resistor current;

first actuation means for actuating said first interrupter means so that said circuit current is commutated to obtain said resistor current, wherein energy used for the action of said first actuation means is precharged before starting the interruption of said circuit current; and

second actuation means for actuating said second interrupter means so that said resistor current is cut off at or after the start of the commutation of said circuit current, wherein energy used for the action of said second actuation means is delivered from a breaker driver which is adapted to said hybrid circuit breaker.

4,617,436

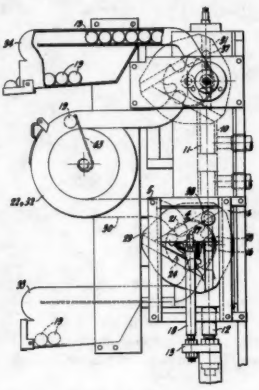
ACTUATOR FOR AN ELECTRICAL CIRCUIT INTERRUPTER

Ronald W. Crookston, Trafford, and Hayes O. Dakin, Jr., North Huntingdon, both of Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Oct. 26, 1984, Ser. No. 664,989

Int. Cl.[4] H01H *33/28*

U.S. Cl. 200—148 R **16 Claims**



1. An actuator for an electrical circuit interrupter utilizing power units which when actuated generate a flow of high pressure gas for actuating the interrupter comprising:

a storage magazine for storing and supplying a plurality of said gas generating power units, each of such units having an exit port controllably providing said high pressure gas flow therefrom;

a power cylinder connected to said interrupter and having an input port responsive to said high pressure gas flow for actuating said interrupter;

transfer means including a rotatable turret head located in physical proximity to said input port of said power cylinder for receiving said power units supplied by said storage magazine, successively juxtaposing one at a time the exit ports of such received power units with said input port, and for ejecting such power units after being actuated to generate said flow of high pressure gas.

4,617,437

IGNITION SWITCH WITH SELF-ADJUSTING HEADLAMP DIMMER

Daniel J. DuRocher, Nauvoo, Ill., assignor to Methode Electronics, Inc., Chicago, Ill.

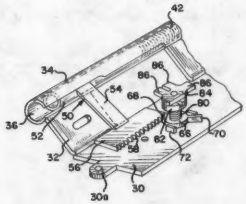
Filed Jun. 8, 1984, Ser. No. 618,525

Int. Cl.[4] H01H *3/40*

U.S. Cl. 200—153 P **4 Claims**

1. A combined automotive ignition switch and self-adjusting automotive dimmer switch, said dimmer switch being of the type having a rotatable contact member with a plurality of contact portions which engage corresponding contacts to effect a switching function, the improvement comprising, in combination, an automotive ignition switch assembly, a self-adjusting dimmer switch mechanism mounted directly on said ignition switch assembly so both are installed in a single operation, said self-adjusting dimmer switch mechanism including a rotatably mounted shaft connected at one end to said rotatable contact member for rotating the latter, gear segment means connected to the opposite end of said shaft for conjoint rotation therewith, dimmer switch actuator means, an arm extending radially from said dimmer switch actuator means, rack means connected to said arm for linear movement conjointly

with said dimmer switch actuator means, said rack means being engaged with said gear segment means to rotate the latter upon linear movement of said rack means in either of two opposite directions, said gear segment means being rotatable by said rack means until said gear segment means reaches a predetermined position where said rack means is engaged with a last tooth at an end of said gear segment means, and spring means operative when said gear segment means is in said predetermined position for biasing said gear segment means in a direc-

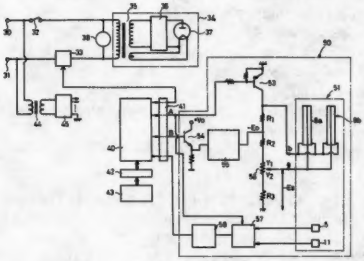


tion opposite to the direction it is urged by said rack means as the latter completes its linear travel whereby upon actuation of said dimmer switch actuator means said rack means is moved linearly thereby rotating said gear segment means to said predetermined position where it remains biased by said spring means until said rack means ratchets past to complete its linear travel and then reverses direction at which time said gear segment means is rotated in the opposite direction and is in a predetermined relationship with said rack means.

4,617,438
APPARATUS WITH AN INFRARED RAY DETECTING TEMPERATURE SENSOR

Takeshi Nakata, Shiga, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Dec. 28, 1984, Ser. No. 687,387
Claims priority, application Japan, Jan. 6, 1984, 59-947
Int. Cl.⁴ H05B *6/68;* **G01J** *1/00*
U.S. Cl. 219—10.55 B **20 Claims**



1. In a microwave oven including a microwave oscillator circuit, and microprocessor means responsive to an output signal from an infrared ray detecting apparatus, for controlling the output power of said microwave oscillator circuit, wherein said infrared ray detecting appparatus comprises:

an infrared ray detecting element;

optical chopper means for making an infrared ray to be measured intermittently incident on said infrared ray detecting element, said optical chopper having at least one bimorph element and a shutter portion mounted to said bimorph element, said shutter portion performing a chopper action in response to displacement of said bimorph element;

driving means including generator means for generating a driving signal having a substantially square wave shape, wave shaping means for forming a rounded leading edge in said driving signal generated by said generator means, for substantially preventing the production of mechanical noise by said bimorph, and coupling means for coupling said driving signal with a rounded leading edge to said bimorph element for driving said optical chopper;

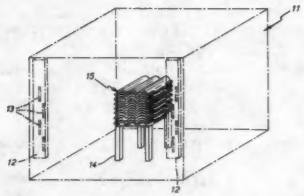
said generator means of said driving means including a source of direct current voltage, and DC-DC converter means connected to said source of direct current voltage for producing said driving signal; and

means responsive to an output signal from said infrared ray detecting element, for producing said output signal of said infrared ray detecting apparatus.

4,617,439
PROCESS FOR HEATING A SUBSTANCE, FOR PURPOSES OF VULCANIZATION OR POLYMERIZATION

Christian Lespinats, Paris, and Michel Minet, Ezanville, both of France, assignors to Valeo, Paris, France

Filed Oct. 1, 1985, Ser. No. 782,453
Claims priority, application France, Oct. 2, 1984, 84 15106
Int. Cl.⁴ H05B *6/80*
U.S. Cl. 219—10.55 M **8 Claims**



1. Process for vulcanizing or polymerizing a non electrically conducting substance comprising the steps of:

sandwiching a layer of the substance between and in intimate touching mating relation with two separate plates of a good electrically conductive metal to form an assembly;

disposing the assembly in a cavity defined by walls at a positive predetermined minimum spacing from the walls of the cavity; and

exposing the assembly to electromagnetic radiation within the decimeter wavelength band at a predetermined power level and for a predetermined time so as to obtain polymerization or vulcanization of the substance.

4,617,440
MICROWAVE HEATING DEVICE

Paul W. Gics, 92 Merriman Rd., Sewickley Hights, Pa. 15143

Filed Nov. 7, 1985, Ser. No. 795,788
Int. Cl.⁴ H05B *6/70*
U.S. Cl. 219—10.55 A **15 Claims**

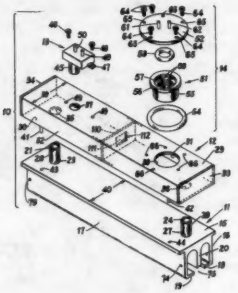
1. A microwave heater assembly, in combination comprising:

elongate waveguide means defining a waveguide cavity therein, said elongate waveguide means having a first and a second antenna receiving holes extending into said waveguide cavity, and having a dummy load receiving hole extending into said waveguide cavity;

elongate resnator means mounted in elongate juxtaposition to said waveguide means, said resonator means having an elongate center wall member with a resonator antenna means projecting through said first antenna receiving hole and within said waveguide cavity;

microwave energy source means mounted to said waveguide means and having a transmitting antenna means projecting through said second antenna receiving hole and within said waveguide cavity; and dummy load means

mounted to said waveguide means and having a fluid container member projecting through said dummy load receiving hole and within said waveguide cavity, said



fluid container member having a fluid receiving cavity defined by a plurality of internal wall surface portions with at least one of said internal wall surface portions having a predetermined slope.

4,617,441

TEMPERATURE CONTROLLED INDUCTION HEATING AND COOKING APPARATUS

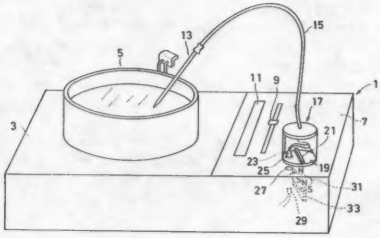
Satoshi Koide, Osaka, and Kiyoshi Hiejima, Shiga, both of, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jun. 22, 1984, Ser. No. 623,788

Claims priority, application Japan, Jul. 8, 1983, 58-106963[U]; Nov. 17, 1983, 58-178183[U]; Apr. 9, 1984, 59-51556[U]

Int. Cl.⁴ H05B *6/06*

U.S. Cl. 219—10.77 **18 Claims**



1. An induction heating cooking apparatus, comprising:

a first power supply for supplying DC voltage,

an inverter which contains an induction coil and is energized by said first power supply,

a cooker main unit for housing said induction coil therein,

a light transmitting part formed in a portion of said cooker main unit,

a connector attached to said cooker main unit in a freely attachable/detachable manner,

a probe containing a thermo-sensitive device and being connected to said connector,

a light emitting device being installed in said connector of said probe for emitting a light signal in response to an output of said thermo-sensitive device, the light signal from said light emitting device being led into said cooker main unit through said light transmitting part,

a light receiving device being installed in said cooker main unit for receiving said light signal,

control means for controlling said inverter in response to an output of said light receiving device, and

change over means responsive to (1) the attachment of said connector to said cooker main unit for permitting light to travel through said light transmitting part, and to (2) the detachment of said connector from said cooker main unit for blocking light from traveling through said light transmitting part to said light receiving device.

4,617,442

INDUCTION HEATING APPARATUS WITH CONTROLLED SWITCHING DEVICE FOR IMPROVED EFFICIENCY

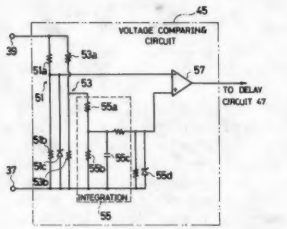
Tadao Okuda, Shiga, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Nov. 16, 1984, Ser. No. 672,386

Claims priority, application Japan, Dec. 14, 1983, 58-236582

Int. Cl.⁴ H05B *6/06*

U.S. Cl. 219—10.77 **6 Claims**



1. An induction heating apparatus comprising:

a heating coil,

a source of dc voltage having positive and negative voltage terminals, said positive terminal being connected to one end of said heating coil,

a switching device which is connected between another end of said heating coil and said negative terminal of said source of dc voltage, for controlling a current flowing through said heating coil,

a voltage sensing means for sensing a voltage across terminals of said switching device,

an integrating means for integrating said voltage across said terminals of said switching device sensed by said voltage sensing means,

a comparing means for comparing said voltage across said terminals of said switching device with said integrated voltage, and

a control means for controlling said switching device based on an output of said comparing means.

4,617,443

EDM APPARATUS PULSE GENERATOR

Roland Martin, Valleiry, France, assignor to Charmilles Technologies, S.A., Geneva, Switzerland

Continuation of Ser. No. 520,694, Aug. 5, 1983, abandoned. This application Mar. 25, 1985, Ser. No. 715,537

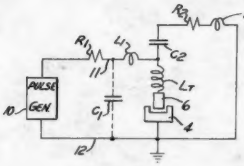
Claims priority, application Switzerland, Aug. 6, 1982, 4742/82

Int. Cl.⁴ B23P *1/02*

U.S. Cl. 219—69 C **11 Claims**

1. In an EDM apparatus wherein a workpiece is machined by electro-erosive electrical discharges by means of an electrode tool, said apparatus comprising an electrical pulse generator connected across the workpiece and the electrode tool by electrical conductors for applying voltage pulses of predetermined waveform across a machining zone between the electrode tool and the workpiece for causing machining electrical dischargess across said machining zone, wherein said apparatus comprises a frame structure, a machining head mounted on said frame structure, an electrode tool holder mounted on said

machining head, said electrode tool being attached to said tool holder and said electrode tool holder being electrically insulated from said machining head whereby a parasitical capacitance is formed between said electrode tool holder and said machining head, said pulse generator, electrical conductors, workpiece, machining zone and electrode tool defining a workpiece machining circuit, and said parasitical capacitance being charged by said voltage pulses applied across said machining zone prior to said electrical discharges occurring across said machining zone and discharged through a circuit



disposed in parallel with said machining circuit and comprising said apparatus frame structure, said machining head, said electrode tool holder, said electrode tool, said machining zone and said workpiece, an improvement comprising an inductance inserted anywhere in the charge and discharge parallel circuit of said parasitical capacitance which comprises said apparatus frame structure, said machining head, said electrode tool holder, said electrode tool, said machining zone and said workpiece only during finish machining of said workpiece by electrical discharges of low energy.

4,617,444

BURNER FOR WIG WELDING

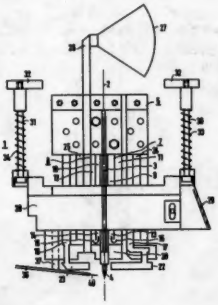
Gerhard Engelhard, Erlangen; Dieter Pellkofer, Herzogenaurach; Jürgen Böhm, and Siegfried Förner, both of Erlangen, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim/Ruhr, Fed. Rep. of Germany

Filed Apr. 1, 1985, Ser. No. 718,066

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1984, 3413102

Int. Cl.[4] B23K *9/16*

U.S. Cl. 219—75 **7 Claims**



1. Burner for WIG-welding a welding seam having a rod-shaped tungsten electrode with an electrode tip facing the welding seam, a coolant line connected to the electrode, and a welding wire guide and a protective-gas feed formed with outlet openings directed towards the seam to be welded, comprising U-shaped coolant channels of copper connected to the tungsten electrode on opposite sides thereof and extending close to the electrode tip, the tungsten electrode being 2 to 4 mm thick, and said coolant channels being disposed in a common plane with the tungsten electrode at a location of the burner which is only 5 mm wide, the electrode tip projecting through an heat resistant insulating cap engaging over ends of said coolant channels facing towards the electrode tip, said coolant channels having a region extending out of said insulating cap and covered with an heat resistant electrically insulating varnish, the protective-gas feed comprising protective-gas feed lines insulatingly fastened to a side of said coolant channels facing away from the tungsten electrode.

4,617,445

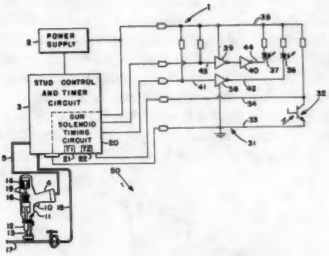
CONTROL CIRCUIT AND METHOD FOR STUD WELDING GUN LIFTING SOLENOID

Richard G. Shaw, and Theodore J. Fahrer, both of Dayton, Ohio, assignors to Erico International Corporation, Solon, Ohio

Filed Sep. 17, 1984, Ser. No. 651,460

Int. Cl.[4] B23K *9/20*

U.S. Cl. 219—98 **20 Claims**



18. A circuit for controlling operation of a stud welding gun lifting solenoid, comprising

input circuit means for supplying electrical power having a cyclically varying characteristic and

power control means, a for controlling the coupling of such electrical power to such gun lifting solenoid, providin relatively high power during lifting mode and relatively lower power during maintenance mode, including

timing circuit means including alternate time constants for determining when in a cycle of such electrical power such coupling is effected,

time changing means for changing the operation of said timing circuit means to change the time when in a cycle of such electrical power such coupling is to be effected including means for selecting one time constant during lifting mode and another time constant during holding mode, and

a phase modulation power control comprising a triggerable switch for controlling the delivery of power to such lifting solenoid and a relaxation oscillator for providing gating signals to the triggerable switch

said phase modulation power control being operable to effect relatively high power input to such gun lifting solenoid during lifting operation and subsequently a relatively lower power to such gun lifting solenoid during holding condition.

4,617,446

WELDING FIXTURE FOR ROTARY CONE ROCK BITS WITH BELLEVILLE SEALS

George F. Anderson, Garden Grove, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Oct. 9, 1984, Ser. No. 659,113

Int. Cl.[4] B23K *15/00, 26/00*

U.S. Cl. 219—121 LC **6 Claims**

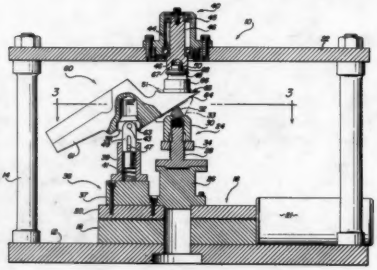
1. A welding fixture to weld a metal static portion of a belleville seal to a journal bearing, said journal bearing extend-

ing from a leg of a sealed bearing rotary cone rock bit, said welding fixture comprising:

a frame, said frame consisting of a base portion and a parallel spaced-apart top portion, said top portion being supported by support means interposed between said base portion and said top portion, said means to support said top portion is at least four posts connected between said base portion and said top portion,

a rotary table connected to said base portion, said rotary table having means to support said leg of said rock bit, said means to support said leg of said rock bit is a centrally positioned pintle mechanism mounted to said rotary table, said mechanism having engagement means at a first end that engage a shirttail portion formed by said leg of said rock bit, said first end being substantially aligned with an axis of said journal bearing of said rock bit, said engagement means within said pintle mechanism is a threadable pin that is threadably rotated outwardly to engage said shirttail portion of said rock bit leg,

said rotary table having means to rotate said leg of said rock bit, said means to rotate said leg is a leg rotation mechanism adapted to engage a lube reservoir chamber formed in a leg backface of said rock bit leg, a head portion of said leg rotation mechanism has engagement means within said leg rotation mechanism to engage said head within an opening to said reservoir chamber formed by said leg to rotate said rock bit leg during said welding operations, said engagement means within said leg rotation mechanism to engage said head within said reservoir opening is a coil spring,



means for rotating said rotary table, said means for rotating said rotary table is an electric motor, said electric motor is a variable speed electric motor having means associated therewith to vary the rotational speed of said rotary table during welding operations,

means connected to said top portion for engaging said journal bearing, said means securely supports said journal bearing about its axis of rotation when said rotary table rotates said leg, said means is a collet adapted to be engaged with an axially aligned spindle bearing formed by and extending from an end of said journal bearing, said collet further engages a thrust face formed by said journal bearing, said thrust face is transverse to an axis of said journal bearing, said collet is rotatively mounted within a collet retention means mounted to said top portion, said collet assures secure rotational alignment of said journal bearing of said rock bit leg during said welding operation, and

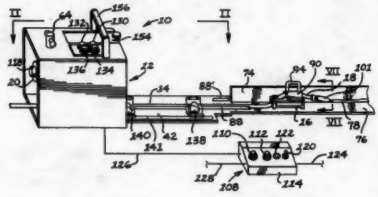
an opening formed in said top portion, said opening is positioned adjacent said means for engaging said journal bearing, said opening permits a welding process to direct a beam of energy to an intersection formed between said metal static portion of said belleville seal and said seal and said journal to metallurgically bond said seal to said leg when said rotary table rotates said leg while said welding process is in operation.

4,617,447

DRIVE ASSEMBLY FOR DRAWING A MOVABLE WELDING CARRIAGE AND METHOD OF WELDING

William T. O'Donohue, Shorewood, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Mar. 1, 1985, Ser. No. 707,356
Int. Cl.[4] B23K *9/12*
U.S. Cl. 219—124.31 **11 Claims**



1. A drive assembly for moving a welding nozzle along a predetermined path, said welding nozzle being connected at one end to a welding cable which has an outer surface and an internally positioned electrical conductor extending between a source of electrical current and the nozzle assembly, said drive assembly comprising:

a motor,

a driven shaft operatively connected to the motor,

means for selectively interrupting and restoring the flow of current from said source to said nozzle assembly in response to angular rotation of the drive shaft,

a welding cable engaging mechanism operatively driven by the motor and having peripheral surface complementary to the outer surface of said welding cable,

means for operatively controlling and selectively varying the speed of said welding cable engaging mechanism during a welding operation, and

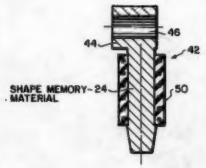
means for urging the welding cable into pressure contact with the peripheral surface of said welding cable engaging mechanism.

4,617,448

ELECTRICALLY RELEASABLE LOCKING DEVICE

Michael P. Goldowsky, Valhalla, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Dec. 18, 1984, Ser. No. 682,977
Int. Cl.[4] H05B *3/58;* **F16B** *2/02;* **B23P** *11/02*
U.S. Cl. 219—200 **13 Claims**



1. An electrically releasable locking arrangement, comprising:

a frame,

a member mounted to be movable with respect to said frame, and having an abutment surface, and

means, including a locking surface, engaging said frame for releasably pressing the locking surface against the abutment surface, arranged such as to prevent relative movement of said member with respect to the frame,

characterized in that said means comprises:

a locking element made of a shape memory material having a given shape transition temperature higher than a se-

lected temperature at which the arrangement is to remain locked, deformed below said given temperature from a first shape to a second shape in which the locking element presses the locking surface against said abutment surface so as to lock the member against relative movement with respect to the frame; said element being so arranged with respect to the frame and the member that, when the element is in said first shape, said locking surface is spaced from said abutment surface such that the member is free to move with respect to the frame, and

means for heating said element to raise the temperature of the element above the transition temperature,

whereby upon activating said means for heating, the element will undergo transition from the second shape to the first shape and will release the member.

4,617,449

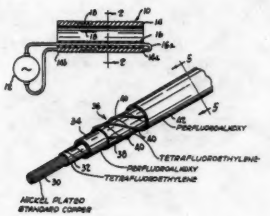
HEATING DEVICE FOR UTILIZING THE SKIN EFFECT OF ALTERNATING CURRENT

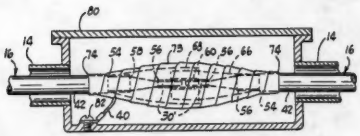
Harold B. Weitzel, Strongsville, and David G. Parman, Medina, both of Ohio, assignors to Ricwil, Incorporated, Brecksville, Ohio

Division of Ser. No. 563,165, Dec. 19, 1983, Pat. No. 4,532,375, which is a division of Ser. No. 313,937, Oct. 22, 1981, Pat. No. 4,436,565. This application May 9, 1985, Ser. No. 732,074

Int. Cl.[4] H05B *3/00*; H02G *15/10*

U.S. Cl. 219—301 **4 Claims**





4. A heating device for maintaining a pipe line or the like, at an elevated temperature utilizing the skin effect of alternating current, comprising:

(a) a ferromagnetic tube in heat transfer relation with a pipe line to be heated;

(b) at least two lengths of power cable serially disposed in said ferromagnetic tube, each cable length having a feed end and a terminal end and at least one cable length being capable of operating continuously with an applied voltage of at least 5 kv and at a continuous operating temperature of at least 210° C., said one cable length comprising:

(i) a centrally located conductor surrounded by a layer of semiconductor material;

(ii) a primary insulation layer surrounding said semiconductor layer;

(iii) a shield layer surrounding said primary insulation; and,

(iv) an outer insulation jacket surrounding said shield layer;

(c) a cable splice joining said lengths of power cable, comprising:

(i) a conductor juncture, mechanically joining the conductor ends of the feed end of one length of power cable to the terminating end of the other length of power cable;

(ii) a layer of semiconductor material surrounding said conductor junction, formed by spirally wrapping carbonized, tetrafluoroethylene tape around said joined conductors;

(iii) a predetermined thickness of primary insulation surrounding said semiconductor layer, said predetermined thickness formed by spirally wrapping and heat fusing a plurality of layers of tetrafluoroethylene tape, each layer being less than said predetermined thickness such that a substantially void free insulation thickness is achieved which is at least as thick as the primary insulation thickness of said cables;

(iv) a discontinuous shield layer formed by spirally wrapped, semiconducting tape extending from the ends of each cable including portions in overlying, concentric relation;

(v) insulation insulating said overlying portions from each other;

(vi) means electrically communicating the shield layer of one of said lengths of cable to said ferromagnetic tube;

(vii) a layer of insulation surrounding said cable splice, extending between the ends of said lengths of said cable and formed by spirally wrapping and heat fusing tetrafluoroethylene tape such that said layer is substantially void free and is at least as thick as the outer insulation jacket of said cables.

4,617,450

PROCESS FOR MANUFACTURE OF A VACUUM-MOULDED ELECTRICAL HEATING UNIT

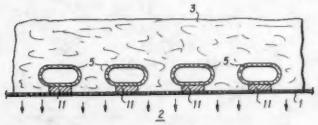
Josef Boes, Weilrod, and Leo Saris, Nauheim, both of Fed. Rep. of Germany, assignors to Bulten-Kanthal GmbH, Morfelden-Walldorf, Fed. Rep. of Germany

Filed Mar. 22, 1983, Ser. No. 477,725

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1982, 3233181

Int. Cl.[4] H05B *3/26*

U.S. Cl. 219—345 **6 Claims**



1. A vacuum-moulding process for manufacturing an electrical heating unit, in which process a resistance heating coil is placed on a sieve-like tray, in a frame above a suction box, and a slip is introduced into the frame, this slip being composed of a slurry of ceramic fibers, a binder and water, such that upon the application of suction the ceramic fiber layer builds up under the action of the suction, this layer being cured, and containing the resistance heating coil as an embedded heating element, wherein those portions of the surface of the sieve-like tray which lie beneath the resistance heating coil are designed to be impervious to, and are narrower than, one of the group of maximum diameter and width of the heating coil in a plane parallel with the sieve-like tray, whereby the space inside the heating coil remains substantially free of fiber material during the vacuum moulding operation.

4,617,451
INDUCTANCE SENSOR

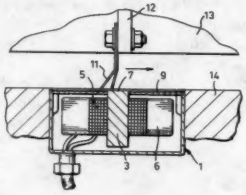
Stanley Gibson, Bangor; Colin Tindall, Ballynahinch, and John Graham, Ballyclare, all of Northern Ireland, assignors to Davidson & Company Limited, Belfast, Northern Ireland

Filed Aug. 1, 1984, Ser. No. 636,573

Claims priority, application United Kingdom, Aug. 3, 1983, 8320962

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—490 **11 Claims**



1. A regenerative air pre-heater comprising:

a rotary matrix (13);

a non-rotary axially adjustable member (14) with said rotary matrix (13) and axially adjustable member (14) presenting opposing spaced apart faces with a plurality of elongate sealing strips (11) carried on said rotary matrix (13) and arranged to sweep past a sealing surface of said axially adjustable member (14) as said matrix (13) rotates;

an inductive sensor (1) for sensing axial spacing of said matrix (13) and axially adjustable member (14) having a U-shaped core with parallel legs including a first leg (3) and a second leg (4), a first coil (5) on said first leg (3) and a second coil (6) on said second leg (4), each of said coils having a plurality of turns with a number of turns in one of said coils being different from a number of turns in the other of said coils;

means for mounting said sensor (1) on said axially adjustable member (14) with said first and second legs aligned with a dimension extending between said legs being generally parallel to the direction of elongation of said strips (11) as said strips pass said sensor (1) opposing said legs;

whereby said strips sweeping past said sensor have an inductive effect indicative of spacing between said strips and said sensor which effect may be measured and used to control axial spacing of said matrix and axially adjustable member.

4,617,452
RICE COOKER

Yoshiyuki Miwa, Aichi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 5, 1984, Ser. No. 678,799

Claims priority, application Japan, Dec. 13, 1983, 58-191853[U]; Jan. 12, 1984, 59-1730[U]; Jan. 13, 1984, 59-3673[U]; Jan. 13, 1984, 59-3674[U]; Jan. 13, 1984, 59-3675[U]; Jan. 23, 1984, 59-7901[U]

Int. Cl.[4] H05B *3/42*

U.S. Cl. 219—441 **17 Claims**

1. A rice cooker comprising:

a body having an upper opening;

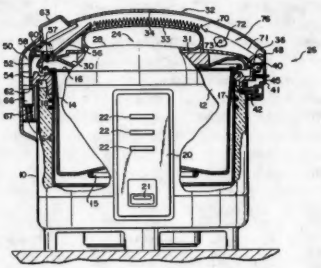
a pot for containing therein water and rice to be cooked, the pot being configured so that it can be placed in the body and taken out of the body through the upper opening, the body being configured so as to hold the pot;

means for heating the pot and any water and rice contained therein, so as to cook the rice;

a lid for opening and closing the upper opening;

support means for swingably supporting the lid relative to the body, said lid having a grip portion extending along the upper surface of the lid from that portion of the lid which is adjacent to the support means to that portion thereof which is opposite to the support means;

a lock mechanism for locking the lid to close the upper opening;



an elongate urging member arranged along the grip portion, one end thereof being connected to the body adjacent to the support means, the other end thereof being connected to the lid, to urge the lid in the direction of opening the lid.

4,617,453
THYRISTOR CONTROLLED POWER SOURCE FOR GRADUALLY DECREASING LOADS

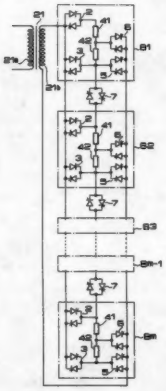
Seiichi Kumon, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Kobe, Japan

Filed Apr. 15, 1985, Ser. No. 723,284

Claims priority, application Japan, May 22, 1984, 59-101760

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—501 **2 Claims**



1. A heating power source device of the type which includes a heating power source unit connected to a secondary winding of a power source transformer, said heating power source unit comprising:

first and second loads each having first and second ends and having such an electric characteristic that said first and second loads have a high electric resistance at the beginning of energization thereof by said power source transformer and the electric resistance becomes lower as the energization time proceeds, the first end of said second load being connected to the second end of said first load; and

four thyristor units each including a pair of thyristors connected in anti-parallel relationship to each other;

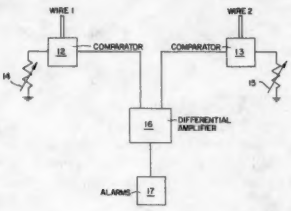
a first one of said thyristor units being connected between a first end of said secondary winding of said transformer and the first end of said first load, a second one of said thyristor units being connected between the first end of said secondary winding and a second end of said second load, a third one of said thyristor units being connected between a second end of said secondary winding said the node between said first and second loads, and the remaining fourth one of said thyristor units being connected between the second end of said secondary winding and the second end of said second load;

said thyristor units being individually controlled to be turned on and off so as to connect said first and second loads in parallel relationship to each other at the beginning of energization and then to connect said first and second loads in serial relationship to each other when an electric current to said loads is increased to a predetermined level whereby fluctuation of the electric current to said loads can be minimized over an entire period of energization of said loads.

4,617,454
THERMAL-SENSITIVE INSULATING COMPOSITION AND METHOD, AND ARTICLE AND APPARATUS INCORPORATING SAME

Milton S. Greenhalgh, Fairfield, Conn., assignor to General Electric Company, Bridgeport, Conn.

Filed Nov. 3, 1983, Ser. No. 548,376
Int. Cl.⁴ H05B *1/02*
U.S. Cl. 219—505 **11 Claims**



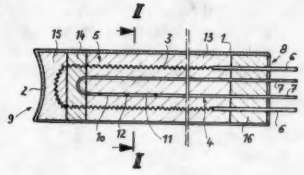
1. The method of producing an insulated electrical conductor having special utility in overheat detection applications, which comprises the step of contacting and thereby covering at least a portion of the length of a metal wire with thermal-sensitive polymeric material which is relatively insensitive to atmospheric moisture fluctuations and is resistant to stress cracking and to corrosion, said polymeric material being selected from the group consisting of (1) a thermosetting acrylonitrile-butadiene rubber containing at least one percent by weight of acrylonitrile, and (2) thermoplastic blends of a polyvinyl chloride and an acrylonitrile-butadiene rubber containing at least one percent of scrylonitrile, in which thermosetting rubber (1) after curing and thermoplastic bland (2) contain substantially no free sulphur.

4,617,455
ELECTRICAL HEATING CARTRIDGE

Eugen Schwarzkopf, Lüdenscheid, Fed. Rep. of Germany, assignor to Hotset Heizpatronen und Zubehor GmbH, Lüdenscheid, Fed. Rep. of Germany

Filed Sep. 10, 1985, Ser. No. 774,462
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1984, 3443306
Int. Cl.⁴ H05B *3/06*; H01C *1/028*
U.S. Cl. 219—523 **6 Claims**

1. In an electrical heating cartridge comprising a jacket in which at least one electrical heating coil and a thermocouple element are positioned, said electrical heating coil and said thermocouple element being imbedded in a packed insulating material with clearance from each other and from said jacket in said electrical heating cartridge, wherein the electrical lead conductors of said electrical heating coil and of said thermocouple element are fed out of a first end piece of said electrical heating cartridge, wherein further said electrical heating coils has a first strand beginning at said first end piece and being

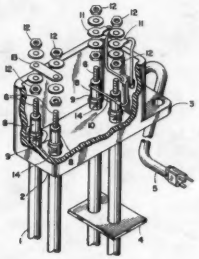


guided toward a second end piece on the end of said electrical heating cartridge opposite to said first end piece and a second strand connected to said first strand and guided back to said first end piece, the improvement wherein said electrical heating coils is directed toward said second end piece and extended over and beyond said thermocouple element until adjacent said end piece.

4,617,456
LONG LIFE CORROSION PROOF ELECTROPLATING IMMERSION HEATER

Tom Richards, Mentor, and Raymond S. Lokar, Cleveland, both of Ohio, assignors to Process Technology, Inc., Mentor, Ohio

Filed Sep. 18, 1984, Ser. No. 651,856
Int. Cl.⁴ H05B *3/78, 3/48*
U.S. Cl. 219—523 **10 Claims**



1. A flexible heating assembly for immersion heating of a liquid in a container, said assembly comprising:

a heating tube having

(a) a heating element being formed of bare wire having a high electrical resistance,

(b) a heat conductive, non-electrically conductive ceramic insulator surrounding said heating element,

(c) a thin-walled metallic tubing surrounding said ceramic insulator, and

(d) an outer tubular casing formed of resilient electrical insulating material having a low surface coefficient of friction and a high resistance to heat and attacks by acid and alkaline solutions or vapors, said outer tubular casing being in direct contact with said thin-walled metallic tubing; and

an associated non-corrosive junction box located without the liquid to be heated, the ends of said heating tube terminating within said junction box and having power supply means connected to said heating element and a grounding means connected to said metallic tubing within said junction box,

clamping means surrounding each end of said outer tubular

casing within said junction box, said clamping means applying a compressive force continuously around said outer tubular casing so as to prevent any corrosive liquid or vapors from penetrating between said outer tubular casing and said clamping means,

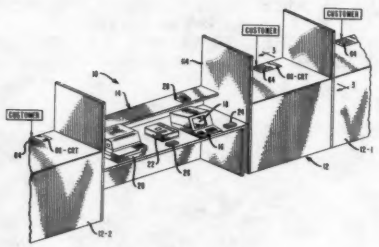
and the remaining interior of the junction box being filled with a potting material which covers all electrical connections, the ends of the outer tubular casing and clamping means, said clamping means being receptive to the potting material so that a gas-tight seal is effected between the outer surface of the clamping means and the potting material.

4,617,457

TELLER-ASSISTED, CUSTOMER-OPERATED ATM DOCUMENT CASHING SYSTEM

Robert H. Granzow, Miamisburg, and Kimbrough I. Myers, Kettering, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 19, 1983, Ser. No. 562,786
Int. Cl.[4] G06F *15/30*
U.S. Cl. 235—379 **14 Claims**



1. A document cashing system comprising:

storage means for storing data associated with users of said system;

a machine for performing financial transactions including the dispensing of cash;

said machine comprising:

means for identifying a user of said machine;

means for entering data including the monetary amount about a document to be processed;

means for receiving a document to be processed;

means for generating image data of the front and back of said document; and

means for moving said document received by said receiving means in said machine and also in operative relationship with said image data generating means;

said system further comprising:

evaluating means to enable a teller in said system to evaluate said document and said user, said evaluating means including a display and a keyboard including function keys; and

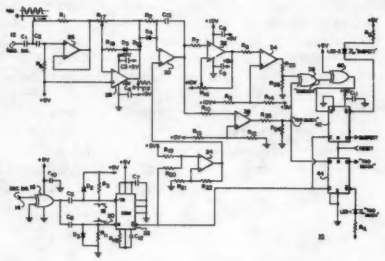
means for coupling said storage means, said machine, and said evaluating means to enable data associated with said user to be displayed on said display, said coupling means also coupling said image data generating means with said display to enable said image data to be displayed at said display; said dispensing of cash from said machine being initiated in response to an actuation of a selected one of said function keys by said teller.

4,617,458

COUNTERFEIT DETECTION CIRCUIT

David R. Bryce, Morrisville, Pa., assignor to Brandt, Inc., Bensalem, Pa.

Filed Feb. 11, 1985, Ser. No. 700,048
Int. Cl.[4] G06K *7/08*
U.S. Cl. 235—449 **12 Claims**



1. Apparatus for evaluating paper currency for genuiness, said paper currency moving one bill at a time at spaced intervals along a feed path and being passed through a magnetic field while moving along said feed path, said apparatus comprising:

sensing means adjacent the feed path for detecting the presence of particles on the bill affected by said magnetic field for generating a detection signal due the presence of the aforementioned particles;

filter means for passing only those frequencies of the detection signal above a predetermined frequency value;

means for rectifying the signal outputted by said filter means;

bill detection means arranged along the feed path for sensing the presence of a bill to generate a bill presence signal have a first state representing the presence of a bill adjacent to the bill detection sensor and having a second state representing the absence of a bill adjacent to bill detection sensors;

means responsive to the bill presence signal for generating a reference signal having a first constant level responsive to the presence of the first state and a second constant level responsive to the presence of the second state of said bill presence signal;

means for integrating the rectified signal developed at the output of said rectifying means;

means for comparing the integrated signal against said reference level signal to develop a ramp signal which deviates from the level of the reference level signal as a function of the amount of magnetic flux detected during the detection interval; and

first means for comparing the ramp signal against a fixed threshold when the bill presence signal changes from said first to said second state for generating a suspect signal when the total value of magnetic flux detected is less than the amount normally encountered for a genuine bill.

4,617,459

AUTOMATIC FOCUSING DEVICE WITH LOW LIGHT CONTRAST INHIBITING MEANS

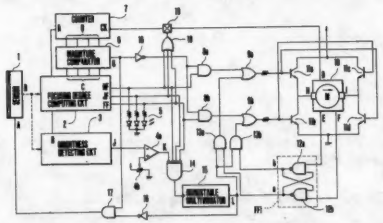
Akira Akashi, and Masanori Yamada, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 6, 1983, Ser. No. 558,776
Claims priority, application Japan, Jun. 12, 1982, 57-213716
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201 **4 Claims**

1. An automatic focusing device having a detecting circuit for detecting an object by a sensor so as to calculate information concerning the amount of movement of a lens to an in-focus position on the basis of an output of the sensor and for detecting whether contrast of the object is low or not, and

having a driving circuit for driving the lens in response to the information calculated by the detecting circuit so as to carry out the focusing operation, said device comprising:

(a) a control circuit for inhibiting the response of the driving circuit to the information when the detecting circuit detects that the contrast is low and for producing a driving



signal for driving the lens irrespective of the information so as to operate the driving circuit by the signal;

(b) a detecting circuit for detecting a brightness level of the object; and

(c) an inhibiting circuit for inhibiting the operation of the driving circuit when the detecting circuit detects that the brightness level is below a predetermined value.

4,617,460

OPTICAL FIBER SENSOR HAVING SHAPED ENDS

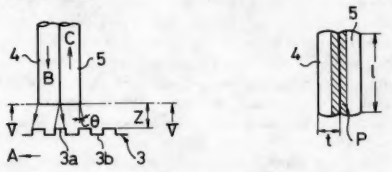
Ichiro Tokunaga; Hiroshi Matsunaga, and Yoji Shimojima, all of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Apr. 13, 1984, Ser. No. 599,944

Claims priority, application Japan, Apr. 13, 1983, 58-63746

Int. Cl.[4] H01J *5/10*

U.S. Cl. 250—227 **4 Claims**



1. In an optical fiber sensor comprising an optical fiber coupled with a light emission element and another optical fiber coupled with a light receiving element, end portions of the optical fibers being arranged side by side and joined together in contact along side surfaces thereof, and disposed in opposition to a slit member to be detected so that the arranged direction of the two optical fibers is aligned with a shifting direction of the slit member; the improvement wherein said end portions of the optical fibers are flattened in cross-section joined together within said cross-section.

4,617,461

FLUORESCENT OPTICAL SWITCH AND KEYBOARD APPARATUS

Wunnava V. Subbarao, Miami, Fla., and Richard I. Ely, Flemington, N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Apr. 25, 1984, Ser. No. 603,876

Int. Cl.[4] G01D *5/34*

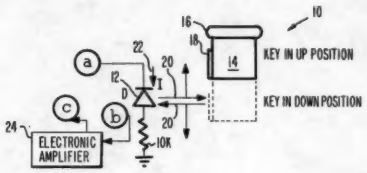
U.S. Cl. 250—229 **7 Claims**

1. Fluorescent optical switch and keyboard apparatus comprising:

photo-optical means adapted to operate in a light emitting, a light receiving and a passive mode,

fluorescent means disposed adjacent to said photo-optical means and capable of movement from a light blocking to a light passing position, and

circuit means interconnected to said photo-optical means for energizing said photo-optical means to a level causing said photo-optical means to emit light for impingement upon



said fluorescent means when said fluorescent means is disposed in a light fluorescent position, said circuit means thereafter biasing said photo-optical means so as to cause said photo-optical means to act as a light receptor and to generate an electrical signal output indicating the actuation of the device.

4,617,462

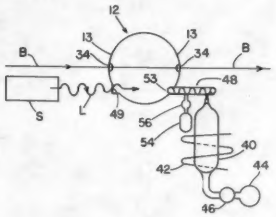
POLARIZED INTERNAL TARGET APPARATUS

Roy J. Holt, Downers Grove, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 10, 1984, Ser. No. 659,587

Int. Cl.[4] H01S *1/00, 9/00;* **H05H** *3/02*

U.S. Cl. 250—251 **2 Claims**



1. A polarized internal target apparatus, comprising the combination of structural means having diametrically opposite openings for the passage of a particle beam and otherwise defining a cell region, means for forming a mixture of target gas and alkali gas atoms at a ratio of the order of about 20–200:1 and introducing the mixture to the cell region, means for passing a high intensity polarized light source into the mixture to polarize the alkali atoms, the polarized alkali metal gas atoms in collisions with the target gas atoms causing polarization of the target gas atoms, and means for subjecting the target cell to a magnetic field of the order of 3–50 gauss, the target gas atoms being hydrogen or deuterium and the alkali atoms being sodium or potassium.

4,617,463

SEGMENTED OPTICAL SYSTEM FOR AN ALARM SYSTEM

Allen D. Muirhead, Rossendale, England, assignor to Monicell Limited, Lancashire, England

Filed Dec. 12, 1984, Ser. No. 681,514

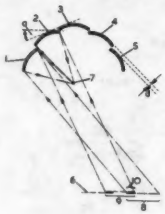
Claims priority, application United Kingdom, Dec. 15, 1983, 8333400

Int. Cl.[4] G01J *1/00*

U.S. Cl. 250—342 **4 Claims**

1. A segmented optical system for an alarm system, compris-

ing a plurality of optical elements each of which is arranged to direct radiation from a predetermined direction towards a common focal point whereby each optical element defines a respective discrete field of view to an observer at the focal



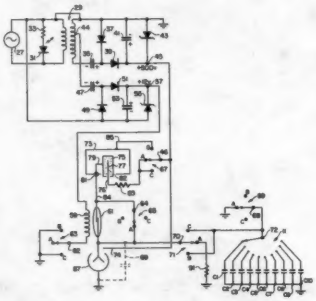
point, wherein adjacent fields of view overlap so that an object moving from within one field of view towards an adjacent field of view enters an area which is common to the said one and the adjacent fields of view.

4,617,464

SAMPLING AND RECORDING DOSE RATE METER

Stanley Kronenberg, Skillman, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 6, 1984, Ser. No. 597,305
Int. Cl.[4] H01J *39/29*
U.S. Cl. 250—377 **7 Claims**



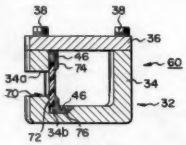
1. A handheld dosimeter for civil defense use comprising:
a hand-cranked generator;
radiation detector means including a first Geiger-Mueller tube detector and a second ion tube detector;
first switching means for selectively connecting the output of said generator to one of said first and second detectors;
timing circuit means energized by said generator for providing a precise predetermined sampling interval;
an electrometer connected to said timing circuit means;
second switching means for selectively connecting the output of said first and second detectors to said electrometer and timing circuit means to selectively energize said electrometer;
a plurality of storage capacitors selectively coupled in parallel with said electrometer for receiving the charge accumulated thereon and selecting the sensitivity ranges of said detectors; and
means for compensating for the internal discharge of said storage capacitors through said electrometer including a wire connected to said high voltage circuit and extending to the vicinity of said electrometer;
said dosimeter having three modes of operation, the first mode being a charge and continuous counting mode in which the output of said Geiger-Mueller tube is continuously applied via said second switching means to said electrometer, the second mode being a high sensitivity dose rate measuring mode in which the output of said Geiger-Mueller tube is applied via said second switching means to said electrometer and to said plurality of storage capacitors, and the third mode being a low sensitivity dose rate measuring mode in which the output of said ion chamber is applied via said second switching means to said electrometer and to said plurality of storage capacitors.

4,617,465

RADIATION DETECTOR VESSEL

Yuzo Yoshida, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed May 16, 1984, Ser. No. 610,695
Claims priority, application Japan, May 23, 1983, 58-89195
Int. Cl.[4] G01T *1/185*
U.S. Cl. 250—385 **7 Claims**



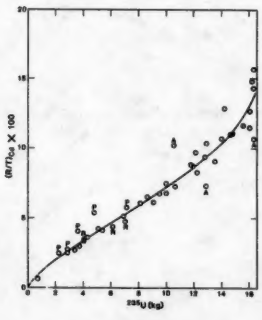
1. A radiation detector vessel enclosing a plurality of radiation detecting elements that convert the intensity of radiation into an electric signal, comprising:
an elongated housing curved along the longitudinal direction thereof in which a gas is sealed, said housing including a vessel member having an opening of sufficient size to allow loading of the radiation detecting elements into said vessel member and a cover member covering said opening of said vessel member, said vessel member further including a bottom interior face, a side wall on the side of the center of curvature, a cut in said side wall extending along the longitudinal direction of said housing, and an egagement groove in said bottom face adjacent said side wall, said engagement groove extending in the longitudinal direction of said housing and having a bottom face, a first side face adjacent said side wall, and a second side face spaced from said side wall, wherein said second side face inclines away from said side wall;
a radiation window through which radiation is led into said housing, said radiation window including a window member formed of carbon fiber reinforced plastic and curved in conformity with an inside face of said side wall to cover said cut, said window member being pressed against said inside face of said side wall by the pressure of the gas sealed in said housing;
reinforcing means connected to said inside face of said side wall of said housing for holding said window member between said reinforcing means and said inside face of said side wall of said housing, said reinforcing means including a reinforcing member having an engagement portion extending in the longitudinal direction of said housing and fitting into said engagement groove, said engagement portion having an inclined face slidably contacting said second side face of said engagement groove; and
means for urging said engagement portion of said reinforcing member toward said bottom face of said engagement groove to slide said engagement portion along said second side face of said engagement groove toward said side wall to press said window member against said inside face of said side wall of said housing.

4,617,466

DIRECT FISSILE ASSAY OF ENRICHED URANIUM USING RANDOM SELF-INTERROGATION AND NEUTRON COINCIDENCE RESPONSE

Howard O. Menlove, and James E. Stewart, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 4, 1985, Ser. No. 697,989
Int. Cl.[4] G01T *3/00*
U.S. Cl. 250—390 8 Claims



1. An apparatus for determining the quantity of fissile nuclides contained in a sample having substantially one type of fissile nuclide in the presence of nuclides which spontaneously generate alpha particles and nuclides which interact with alpha particles to produce neutrons, by random self-interrogation and neutron coincidence response, said apparatus comprising in combination:

a. a plurality of neutron detectors disposed in a substantially cylindrical manner around the cylindrical sample under investigation so that a fraction of neutrons escaping from the cylindrical sample as a result of fission processes in the fissile nuclides, (α,n) processes in other nuclides, and from less important sources of neutrons are received and detected by said plurality of neutron detectors so as to produce signals which represent individual neutrons having been detected;

b. means for receiving said signals produced from said plurality of neutron detectors and for recording the total number of neutrons exiting the sample and reaching said plurality of neutron detectors and the total number of neutrons reaching said plurality of neutron detectors in coincidence with a chosen time interval said means being used to provide the ratio of the number of neutrons reaching said plurality of neutron detectors in coincidence within the chosen time interval to the total number of neutrons reaching said plurality of neutron detectors, wherein said ratio is related substantially to the quantity of fissile material present in the sample under investigation.

4,617,467

APPARATUS FOR CHARACTERIZING KEROGENS

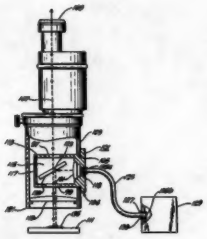
Joseph T. Senftle, and Stephen R. Larter, both of Lake Elsinore, Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Nov. 16, 1984, Ser. No. 672,395
Int. Cl.[4] G01N *21/64*
U.S. Cl. 250—461.1 9 Claims

1. An illuminator adapted to be coupled to a microscope to provide radiation in the ultraviolet region which comprises:

(a) a housing having an internal passage way, in optical communication with two windows defined by said housing, said housing being adapted to couple to a microscope body with said windows aligned with the optical axis of the microscope,

(b) a mirror located within and extending substantially completely across said internal passageway and adapted to reflect ultraviolet radiation at a first wavelength and transmit radiation at a longer wavelength than said first wavelength, said mirror being positioned to intersect said optical axis of the microscope at an angle of about forty five degrees,



(c) a fiber optic cable having a first end coupled with said housing and a second end adapted to receive ultraviolet radiation, said fiber optic cable being adapted to introduce ultraviolet radiation into said internal passageway for downward deflection by said mirror along said optical axis of the microscope, and

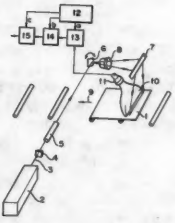
(d) a source of ultraviolet radiation comprising a laser adapted to illuminate said second end of said fiber optic cable.

4,617,468

STIMULABLE PHOSPHOR SHEET WITH HYDROPHILIC SURFACE

Hisashi Shiraishi, Minami-ashigara; Hisatoyo Kato, and Junji Miyahara, both of Kaisei, all of Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Feb. 23, 1984, Ser. No. 582,767
Claims priority, application Japan, Feb. 24, 1983, 58-30605
Int. Cl.[4] G01T *1/10*
U.S. Cl. 250—484.1 6 Claims



1. A stimulable phosphor sheet which comprises:

a plastic substrate;

a phosphor layer being provided on the substrate and comprising a stimulable phosphor dispersed in a binder; and

a plastic protective layer provided on the phosphor layer, said protective layer having a hydrophilically-processed surface to receive superposition of a hydrophilic material thereon.

4,617,469

EXPOSURE APPARATUS WITH DETECTING MEANS INSERTABLE INTO AN EXPOSURE PATH

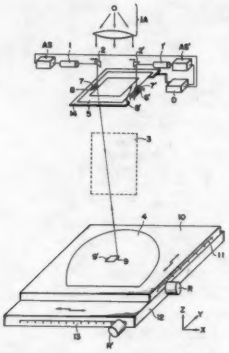
Kazuo Takahashi, Kawasaki; Hiroshi Sato, Tokyo, and Masao Kosugi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 16, 1983, Ser. No. 552,313

Claims priority, application Japan, Nov. 26, 1982, 57-207207

Int. Cl.[4] G01N *21/86*

U.S. Cl. 250—548 **19 Claims**



1. An alignment apparatus for aligning an original and a photosensitive member, said apparatus comprising:

means for exposing the photosensitive member to an image of the original through an exposure optical path extending between the original and the photosensitive member;

first detecting means mounted for insertion into and retraction from the exposure optical path, said first detecting means being capable of detecting positional deviation between the original and the photosensitive member when inserted in the exposure optical path;

second detecting means disposed out of the exposure optical path to detect a change in the position of at least one of the original and the photosensitive member and for producing an output representing said change in position; and

means for correcting positional deviation between the original and the photosensitive member in accordance with the positional deviation detected by said first detecting means, said correcting means confirming the correction of the positional deviation on the basis of the output of said second detecting means.

4,617,470

METHOD AND APPARATUS FOR DETECTING THE LEADING EDGE OF A SHEET TO BE SCANNED

Kazuo Horikawa, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 408,049, Aug. 13, 1982. This application Jan. 18, 1985, Ser. No. 692,761

Claims priority, application Japan, Aug. 19, 1981, 56-129809

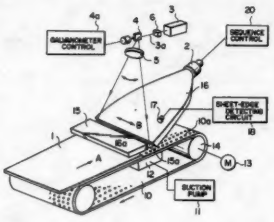
Int. Cl.[4] G01V *9/04*

U.S. Cl. 250—561 **7 Claims**

1. A method of detecting the leading edge of a sheetlike object to be scanned in an image scan system wherein main scanning of the sheet-like object is performed by making a beam of light oscillate back and forth in a first direction with the aid of optical deflection means, disposing said sheet-like object in a plane containing said first direction and sub-scanning of the sheet-like object is performed by moving the sheet like object within said plane in the direction perpendicular to said first direction, the method comprising:

oscillating a light beam back and forth in said first direction, the method comprising:

moving the sheet-like object in the sub-scanning direction toward the oscillating light beam;



detecting the reflection of said beam of light from the leading edge of said sheet-like object, thereby detecting the leading edge of the sheet.

4,617,471

IMAGE SENSING DEVICE

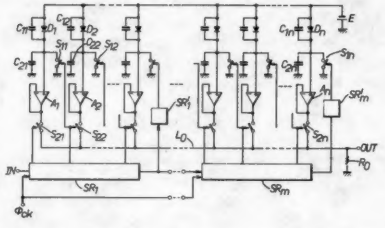
Kouhei Suzuki, Yokohama; Tamio Saito, Oume, and Ken-ichi Mori, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 14, 1984, Ser. No. 681,657

Claims priority, application Japan, Dec. 27, 1983, 58-246375; Mar. 31, 1984, 59-63525

Int. Cl.[4] H01J *40/14*

U.S. Cl. 250—578 **13 Claims**



1. An image sensing device comprising:

a substrate;

a plurality of photovoltaic conversion elements formed as an array on said substrate for converting incident light from an image plane to be read into electrical signals, each said photovoltaic conversion element having opposed electrodes and a photovoltaic conversion layer therebetween;

means for reading said electrical signals converted by said photovoltaic conversion elements;

a plurality of conductive strips defining wiring patterns formed on said substrate, each conductive strip having a first end connected to one of said electrodes of said photovoltaic conversion elements and a second end connected to said reading means; and

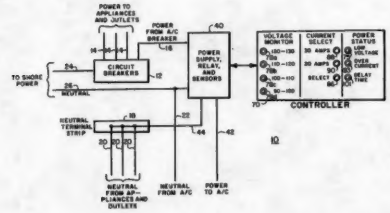
each said conductive strip being dimensioned in relation to the respective electrode connected thereto such that each conductive strip and its respective electrode define a substantially equal value of capacitance.

4,617,472

RECREATIONAL VEHICLE POWER CONTROL SYSTEM

William H. Slavik, Palos Hills, Ill., assignor to Nuvatec, Inc., Downers Grove, Ill.

Division of Ser. No. 515,350, Jul. 19, 1983, Pat. No. 4,499,385.
This application Nov. 30, 1984, Ser. No. 676,570
Int. Cl.[4] H02J 3/14
U.S. Cl. 307—10 R 12 Claims



1. A power control system for a recreational vehicle comprising means for receiving electrical current from a source of power, a major electrically powered appliance, a plurality of additional electrically powered appliances, and means for connecting the major appliance and the additional appliances to the receiving means such that electrical current characterized by a power voltage is supplied to the major appliance and the additional appliances, said power control system comprising:

means for automatically disconnecting the major appliance from the receiving means without disconnecting the additional appliances from the receiving means when the power voltage falls below a selected value;

means for automatically reconnecting the major appliance to the receiving means after the power voltage returns to an operating range; and

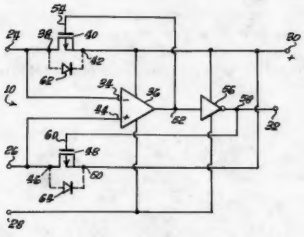
means, included in the connecting means, for continuously connecting the additional appliances to the receiving means during operation of the disconnecting means and the reconnecting means.

4,617,473

CMOS BACKUP POWER SWITCHING CIRCUIT

David Bingham, San Jose, Calif., assignor to Intersil, Inc., Cupertino, Calif.

Filed Jan. 3, 1984, Ser. No. 567,577
Int. Cl.[4] H02J 9/06
U.S. Cl. 307—66 5 Claims



4. A backup power switching circuit comprising:

first and second transistors, each of said transistors including a control electrode, an output electrode, an input electrode, and a substrate;

a reference terminal, adapted to provide a reference potential;

a differential voltage comparator including an inverting input, a non-inverting input, and an output coupled to the control input of said first transistor;

a voltage inverter having an input coupled to the output of the comparator, and an output coupled to the control input of the second transistor;

a first input terminal, coupled to the input electrode of said first transistor and to the inverting input of said comparator;

a second input terminal, coupled to the input electrode of said second transistor and to the non-inverting input of said comparator; and

an output terminal coupled to the output electrodes of said first and second transistors;

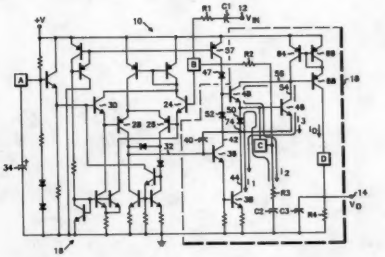
wherein, in dependence on the relative magnitudes of the potentials applied to said first and second input terminals, said first or second transistor is driven into conduction to couple the input terminal having the greater magnitude to said output terminal.

4,617,474

SIGNAL DETECTOR

Barry L. Jason, 325 Warbler Dr., Bedford, Tex. 76021

Filed Jun. 27, 1984, Ser. No. 625,471
Int. Cl.[4] H03K 5/00; H03D 1/00
U.S. Cl. 307—262 11 Claims



1. An AC signal detector, comprising:

an amplifier having an input for receiving signals which undergo positive and negative excursions, and having an output;

a first transistor coupled to the output of the amplifier and responsive to an output signal excursion of a first polarity for developing an increasing level of current and responsive to a signal excursion of the opposite polarity for developing a decreasing level of current;

second and third transistors coupled to an output terminal of the first transistor for conducting on opposite polarities of the input signal, said second transistor being responsive to an increasing level of current in the first transistor for developing a first intermediate current, and said third transistor being responsive to a decreasing level of current in the first transistor for developing a second intermediate current having the same polarity as the first intermediate current; and

means for receiving the first and second intermediate currents and outputting said intermediate currents to a load.

4,617,475

WIRED LOGIC VOTING CIRCUIT

Robert M. Reinschmidt, San Jose, Calif., assignor to Trilogy Computer Development Partners, Ltd., Cupertino, Calif.

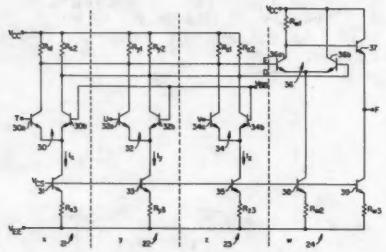
Filed Mar. 30, 1984, Ser. No. 595,086
Int. Cl.[4] H03K 19/23, 19/086; G06F 11/16, 11/26
U.S. Cl. 307—441 4 Claims

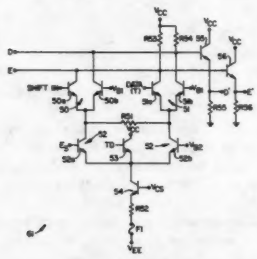
1. A wired logic voting circuit providing an output which follows the majority of input logic levels according to the formula:

$F=AB+AC+BC$

where F is the output of the function described and A, B, and C are the voting input signals, comprising:

a plurality of differential input logic elements, each of said elements comprising a differential transistor pair, the base of a first transistor of said transistor pair providing a voting input, the base of the second transistor of said transistor pair coupled to a reference level signal, the emitters of said transistor pair coupled together at a current sink, the collector of the first transistor of said transistor pair coupled through a resistor to a voltage source to provide a first logic level signal, the collector of the second transistor of said transistor pair coupled through a resistor to said voltage source to provide a second, opposite logic level signal, the collectors of the first transistors for all of said differential transistor pairs being wired together at a first signal node, the collectors of the second transistors for all of said differential transistor pairs being wired together at a second signal node;





an output differential transistor pair, including a first transistor having a base coupled to said first signal node and including a second transistor having a base coupled to said second signal node, the emitters of said output differential transistor pair being coupled together at a current sink, the collector of said first transistor of said output differential transistor pair being coupled through a resistor to a voltage source to provide an actuating output logic level signal, the collector of said second transistor of said output differential transistor pair being coupled to said voltage source, wherein a signal level at one signal node is never equal to a signal level at the other signal node and wherein the polarity of signal level difference between the two signal nodes indicates the majority state of the input logic signals; and

a diagnositic circuit, coupled between the emitters of said logic element transistor pair and said current sink, for locating and isolating defective logic element transistor pairs.

4,617,476

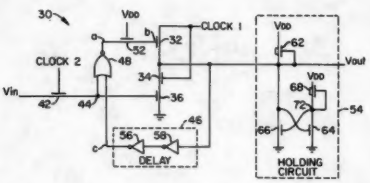
HIGH SPEED CLOCKED, LATCHED, AND BOOTSTRAPPED BUFFER

Monte J. Dalrymple, Fremont, Calif., assignor to Zilog, Inc., Campbell, Calif.

Filed Oct. 16, 1984, Ser. No. 661,345

Int. Cl.[4] H03K *19/096, 19/017*

U.S. Cl. 307—443 **5 Claims**



1. A buffer circuit for deriving, from an input signal, an output signal which is substantially synchronous with at least some of the changes in state of a first clock signal and wherein a change in logic state of the input signal causes a corresponding change in logic state of the output signal, said buffer circuit comprising:

a first transistor whose main current path is connected between the first clock and the circuit output, so that the first clock drives the output directly;

a second and a third transistor whose main current paths are connected in series between the circuit output and ground for pulling the output low, the first clock signal being applied to the gate of the second transistor;

a fourth transistor whose main current path is connected between the input and the gate of the third transistor;

a second clock for applying a second clock signal to the gate of the fourth transistor, so that the input signal is sampled within a time window determined by the second clock signal, and so that the sampled input signal is applied to the gate of the fourth transistor;

a delay means for delaying the output signal;

a NOR-gate receiving at its inputs the sampled input signal and the delayed output signal;

a fifth transistor whose gate is supplied with a first DC voltage and whose main current path is connected between the output of the NOR-gate and the gate of the first transistor for boosting the voltage at the gate of the first transistor so that the delay between the rise times of the first clock and changes in the state of the output signals is reduced, and wherein the delayed output signal is delayed by the delay means by such time that the output signal is allowed to rise to substantially its maximum value before such rise causes the first transistor to be turned off; and

means coupled to the circuit output for holding the value of the output signal when the first transistor is turned off and when the second or third transistors is turned off.

4,617,477

SYMMETRICAL OUTPUT COMPLEMENTARY BUFFER

Michael V. DePaolis, Jr., Center Valley, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 21, 1985, Ser. No. 736,554

Int. Cl.[4] H03K *19/094, 19/20, 17/693, 3/86*

U.S. Cl. 307—443 **10 Claims**

1. Circuitry comprising:

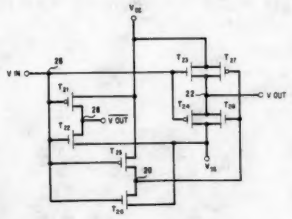
first, second, third, fourth, fifth, and sixth transistors **T21, T22, T23, T24, T27,** and **T28,** respectively, each having a control electrode and first and second output electrodes; **T21, T24,** and **T27** being of a first conductivity type, and **T22, T23** and **T28** being of the opposite conductivity type;

the control electrodes of **T21, T22, T23** and **T24** being coupled together to a circuitry input node;

the second output electrode of T21 being coupled to the second output electrode of T22 and to a first circuitry output node;

the control electrodes of T27 and T28 being coupled to an intermediate node which is characterized to be at a potential level that is the inverse of the level applied to the circuitry input node;

the first output electrodes of T23 and T24 being coupled to



the second output electrodes of T27 and T28 and to a second circuitry output node;

the first output electrodes of T21 and T27, and the second output electrode of T23, being adapted to be coupled to a first potential source; and

the first output electrodes of T22 and T28, and the second output electrode of T24, being adapted to be coupled to a second potential source which has a different potential level than the first potential source.

4,617,478

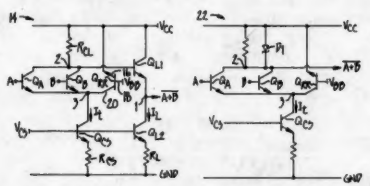
EMITTER COUPLED LOGIC HAVING ENHANCED SPEED CHARACTERISTIC FOR TURN-ON AND TURN-OFF

Hemmige D. Varadarajan, 1768 Lark La., Sunnyvale, Calif. 94087

Filed Sep. 7, 1983, Ser. No. 530,176

Int. Cl.[4] H03K *19/013, 19/086, 19/082, 19/092*

U.S. Cl. 307—455 **4 Claims**



1. A device for switching current, comprising:

a common node connected to receive the current;

an output node connectable to provide an output;

a least one input transistor having a collector connected to said output node, an emitter connected to said common node, and a base connected to receive at least one input signal; and

reference means connected to said common node for supplying a switching bias at said common node, including means for filtering high frequency voltage change at said common node, wherein said filtering means includes a transistor having a base connected to a bias voltage, an emitter connected to a supply voltage and a collector connected to said common node.

4,617,479

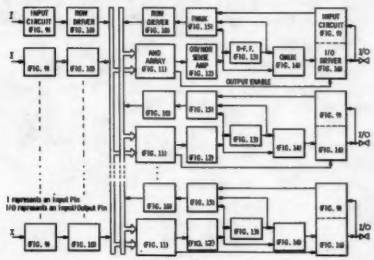
PROGRAMMABLE LOGIC ARRAY DEVICE USING EPROM TECHNOLOGY

Robert F. Hartmann, San Jose; Sau-Ching Wong, Hillsborough; Yiu-Fai Chan, Saratoga, and Jung-Hsing Ou, Sunnyvale, all of Calif., assignors to Altera Corporation, Santa Clara, Calif.

Filed May 3, 1984, Ser. No. 607,018

Int. Cl.[4] G06F *7/00;* **H03K** *19/177, 19/20, 19/094*

U.S. Cl. 307—465 **27 Claims**



1. A programmable logic array device comprising:

means forming a first programmable AND array having a plurality of memory cells arranged in addressable rows and columns and which can be individually programmed to contain logic data;

first input circuit means for receiving a first input signal and for developing a first buffered signal corresponding thereto;

first row driver means responsive to said first bufferred signal and operative to interrogate a particular row of said memory cells and to cause said first AND array to output signals corresponding to the data contained therein;

first sensing means for sensing the signals output by said first AND array and for developing a corresponding first data signal which is the logicial OR of the signals output by said first AND array;

first signal storage means for receiving and temporily storing said first data signal;

first output terminal means; and

first switching means responsive to a control signal and operative to couple either said first data signal or a data signal temporarily stored in said first signal storage means to said first output terminal means.

4,617,480

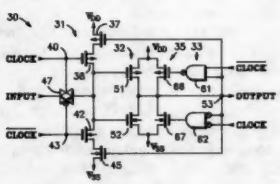
HIGH SPEED DATA SYNCHRONIZER WHICH MINIMIZES CIRCUITRY

Kenneth K. Au, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 22, 1984, Ser. No. 663,517

Int. Cl.[4] H03K *5/135*

U.S. Cl. 307—480 **12 Claims**



1. A high speed data synchronizer circuit for synchronizing an asynchronous input signal with a synchronous clock signal, comprising:

first logic means for receiving the clock signal and a comple-

ment thereof and selectively receiving the input signal and buffering the input signal to provide a first control signal;

second logic means coupled to the first logic means, for providing a buffered output signal at an output terminal in response to the first control signal;

third logic means coupled to the output terminal, to the clock signal and to a complement thereof, for providing second and third control signals in response to both the output and clock signals; and

fourth logic means coupled to the output terminal, for further amplifying the output signal in response to said second and third control signals.

4,617,481

AMPLIFIER CIRCUIT FREE FROM LEAKAGE BETWEEN INPUT AND OUTPUT PORTS

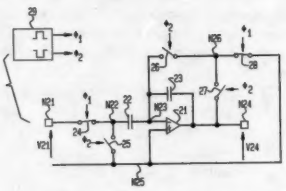
Shinji Masuda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 26, 1983, Ser. No. 545,692

Claims priority, application Japan, Oct. 29, 1982, 57-190201

Int. Cl.⁴ G06G *7/10;* **H03F** *1/02;* **H03B** *1/00*

U.S. Cl. 307—491 **9 Claims**



1. A circuit comprising:

an input terminal receiving an input signal;

a reference potential terminal;

an output terminal for receiving an output signal;

an operational amplifier having an inverting input port connected to said input termihal, a non-inverting input port connected to said reference potential terminal, and an output port connected to said output terminal;

a first switch connected between said inverting input port and a first connection node;

a second switch connected between said first connection node and said output terminal;

a third switch connected between said first connection node and said reference potential terminal; and

a means for controlling said first, second, and third switches, said switch controlling means operatively closing said first and second switches simultaneously and operatively closing said third switch when said first and second switches are opened so that the potential difference between said first connection node and said inverting port is reduced when said first and second switches are open to prevent leakage current from flowing between said inverting input port and said output port of said operational amplifier.

4,617,482

COMPLEMENTARY TYPE MOS FIELD-EFFECT TRANSISTOR CIRCUIT PROVIDED WITH A GATE PROTECTION STRUCTURE OF SMALL TIME CONSTANT

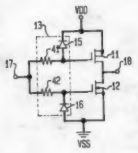
Kohei Matsuda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 11, 1984, Ser. No. 659,789

Claims priority, application Japan, Oct. 12, 1983, 58-157615[U]

Int. Cl.⁴ H03K *17/687;* **H02H** *3/20, 9/00;* **H01L** *27/02*

U.S. Cl. 307—579 **10 Claims**



8. A complementary transistor circuit comprising:

an input terminal receiving an input signal;

a first power source terminal supplying a high voltage;

a second power source terminal supplying a low voltage;

a first insulated gate field effect transistor of one conductivity type;

a second insulated gate field effect transistor of the other conductivity type connected in series with said first transistor between said first and second power source terminals;

a first protection circuit between said input terminal and a gate of said first transistor, said first protection circuit including a first diode connected between said gate of said first transistor and said first power source terminal and a first resistor having one end connected directly to said gate of said first transistor and the other end connected directly to said input terminal; and

a second protection circuit between said input terminal and a gate of said second transistor, said second protection circuit being formed separately from said first protection circuit except for the common connection with said input terminal and including a second diode connected between said gate of said second transistor and said second power source terminal and a second resistor having one end directly connected to said gate of said second transistor and the other end connected directly to said input terminal.

4,617,483

ELECTROTHERMODYNAMIC POWER CONVERTER WITH CONVERGING FLOWS

Alvin M. Marks, 359R Main St., c/o Ardi, Athol, Mass. 01331

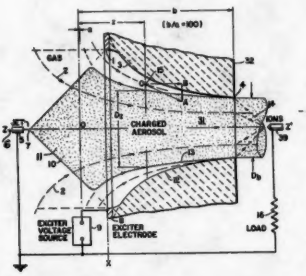
Filed Jan. 27, 1984, Ser. No. 574,374

Int. Cl.⁴ H02N *1/00*

U.S. Cl. 310—10 **18 Claims**

1. In an electrothermodynamic generator for the substantially isothermal conversion of the internal heat power of a flowing gas charged aerosol to electric power, a source of gas, said gas entering said generator at a temperature T_1 and pressure ρ_1 a gas source, a duct connected to said gas source, said duct having a flow axis in the Z direction, said duct converging from an entrance diameter D_a at Z=a to an exit orifice in said duct having a diameter D_b at Z=b, a source of conductive liquid at a pressure and temperature exceeding that of the said gas, a minor orifice for said liquid located on said axis upstream from said duct entrance, said conductive liquid issuing as a jet from said minor orifice, an exciter electrode located at the said duct entrance, an exciter electric potential source, said potential source being connected across said conductive liquid and

said exciter electrode to cause a charged aerosol droplets to form from said liquid jet between said minor orifice and said exciter electrode, a discharge electrode located downstream from the said exit orifice, which injects ions of opposite sign into said charged aerosol, the heat content of said charged aerosol droplets being at least equal to the heat content of the gas in which it is contained, constituting an internal heat source to maintain the charged aerosol gas at nearly constant temperature, said converging duct causing the velocity and kinetic



power of said gas-charged aerosol to increase as it moves along the flow axis from Z=a to Z=b; said gas decreasing in pressure from ρ_1 at Z=a to ρ_2 at Z=b, the ratio of temperature decrease ΔT to the absolute temperature T_1 being less than about 0.1, whereby the charged aerosol gas almost isothermally converts its heat power to electric power, said kinetic power being a small fraction of said electric power; a load resistor, said load resistor being connected between said discharge electrode and said conductive liquid source, said electric power being delivered to said load.

4,617,484

ELECTRIC MOTOR WITH A TORSIONALLY FLEXIBLE ROTOR MOUNT

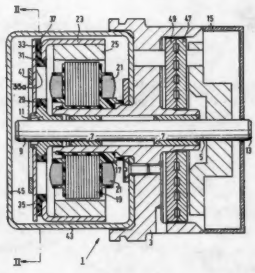
Johannes C. M. Buijsen, Dordrecht, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 25, 1985, Ser. No. 694,714

Claims priority, application Netherlands, Feb. 2, 1984, 8400311

Int. Cl.[4] H02K *5/24*

U.S. Cl. 310—51 **11 Claims**



1. An electric motor comprising a stator, a motor shaft having a hub, a rotor assembly mounted about said shaft, and a plurality of radially extending torsionally flexible spokes interconnecting said hub and said rotor assembly,

characterized by comprising a rigid plate extending radially from and rigidly secured to the hub, and having a surface which extends adjacent to and facing the rotor assembly, and

a vibration-damping element clamped between the plate and the rotor assembly.

4,617,485

ROTOR OF ALTERNATOR MOUNTED ON VEHICLE

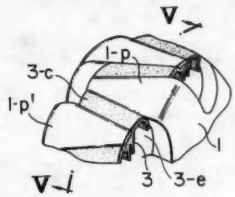
Shigenobu Nakamura, Chiryu; Takayasu Nimura, Nagoya, and Toshiaki Hotta, Oobu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 18, 1984, Ser. No. 682,851

Claims priority, application Japan, Dec. 19, 1983, 58-237871; Jan. 6, 1984, 59-946

Int. Cl.[4] H02K *1/32*

U.S. Cl. 310—65 **7 Claims**



1. In a vehicle-mounted alternator having a rotor including a pair of Randel-type pole cores having mutually meshing claws and an exciting coil provided at the inner side of said pole cores, and a stator having teeth extending radially inwardly to oppose said rotor,

an improved rotor construction comprising: spacers made of a non-magnetic material and disposed between adjacent pole core claws of said pole cores in such a manner as to provide, together with said claws, a substantially smooth cylindrical outer peripheral surface for a portion of said rotor facing said teeth of said stator which prevents the flow of air radially between said claws of said portion and also provide a space constituting a passage for cooling air axially between the inner sides of said spacers and the outer peripheral surface of said exciting coil.

4,617,486

MINIATURE D.C. MOTOR WITH IMPROVED TERMINAL PLATE AND BRUSHES

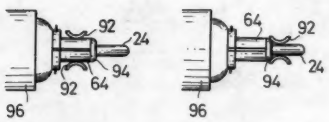
Tetsuro Miyauchi, and Koji Niino, both of Miyazaki, Japan, assignors to S. M. C. Co., Ltd., Osaka, Japan

Filed Apr. 19, 1985, Ser. No. 725,207

Claims priority, application Japan, Apr. 19, 1984, 59-56673[U]; Apr. 19, 1984, 59-56674[U]

Int. Cl.[4] H02K *13/00*

U.S. Cl. 310—233 **20 Claims**



1. A miniature D.C. motor comprising:

a housing for receiving a motor body therein;

a permanent magnet mounted in said housing;

a rotor having a rotor shaft with a longitudinal axis rotatably mounted in said housing adjacent said permanent magnet;

a brush base adapted to the detachable fitted with respect to said housing;

a pair of brushes with support connections to said brush base arranged in said brush base, said brushes each including a contact section which has a convexly curved surface;

detachable connections means adapted to carry out the

detachable fitting between said housing and said brush base; and

a commutator having an outer end formed into a truncated conical shape so as to be pressedly interposed between said convexly curved surfaces of said brushes, said brushes extending across said commutator with said support connection overlapping each other to provide a resilient contact with said curved surfaces of said brushes and said commutator.

4,617,487

PIEZOELECTRIC ELASTIC SURFACE WAVE ELEMENT WITH FILM OF TANTALUM PENTOXIDE OR SILICON NITRIDE

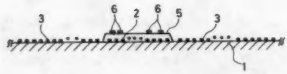
Takehiko Sone; Takehiro Takoshima, and Yoshimi Kamijyo, all of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Sep. 23, 1985, Ser. No. 779,223

Claims priority, application Japan, Sep. 22, 1984, 59-199019; Oct. 8, 1984, 59-211148

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—313 D 2 Claims



1. An elastic surface wave element having a grille-shaped electrode formed on a piezzoelectric substrate, which is characterized by covering said grille-shaped electrode portion with an insulating film of tantalum pentoxide.

4,617,488

COMPOSITE PIEZOELECTRIC VIBRATOR WITH TRAPEZOIDAL CROSS SECTION

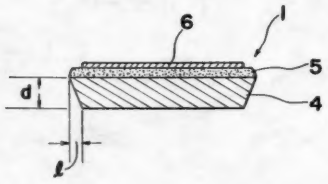
Takeshi Nakamura, Uji, and Ikuo Matsumoto, Nagaokakyo, both of Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Aug. 1, 1985, Ser. No. 761,395

Claims priority, application Japan, Aug. 10, 1984, 59-168677

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—321 2 Claims



1. In a piezoelectric vibrator capable of vibrating in an expansion mode of vibration comprising a piezoelectric vibrating element, composed of a vibrateable substrate, made of a constant elastic metal, a thin film of piezoelectric material and an exciting electrode layer, the improvement wherein the substrate has a generally trapezoidal cross-sectional representation, as viewed in a direction perpendicular to the direction of propagation of vibrations, with one of the opposite surfaces thereof adjacent the thin film being greater than the other of said opposite surfaces.

4,617,489

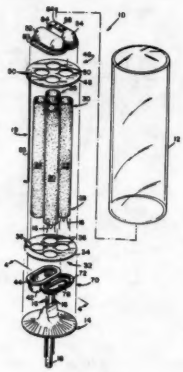
COMPACT FLUORESCENT LAMP HAVING INTERNAL THERMALLY ACTUABLE MEANS

Harold L. Hough, Beverly, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Mar. 21, 1984, Ser. No. 591,744

Int. Cl.[4] H01J *7/26, 61/52, 63/02*

U.S. Cl. 313—13 1 Claim



1. In a fluorescent lamp having an hermetically sealed outer envelope containing an arc generating and sustaining medium; and assembly positioned within said envelope, said assembly comprising a plurality of elongated glass tubes each having first and second ends, said tubes being coated on their interior surface with a phosphor, all of said interior surfaces being open to said medium; at least one arc directing means operatively associated with said first ends of said tubes and including an arc director, said arc director forming a part of the arc path through said tubes; an electrode at either end of said arc path; and means for making electrical connection to said electrodes, said arc directing means comprising a relatively thick, rigid, electrically conductive base member having a plurality of apertures therein, some of the apertures including means formed to receive said electrodes and other of said apertures including means formed to receive the first ends of said tubes that do not contain electrodes; and arc director being associated with said other apertures, the improvement comprising: thermally actuable means associated with said assembly operable to open communications with the interior of said tubes upon application of heat thereto; and operable to form an arc tight seal with the interior of the tubes upon removal of heat therefrom, said thermally actuable means comprising an exhaust port formed in said base member in communication with said arc director and a thermostatic blade associated with said exhaust port and operable to open upon the application of heat.

4,617,490

CATHODE RAY TUBE DEVICE WITH IMPROVED COLOR FILTERING SYSTEM

Brian J. Fitzpatrick, Ossining, and Phyllis M. Harnack, Hastings-on-Hudson, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Dec. 7, 1984, Ser. No. 679,191

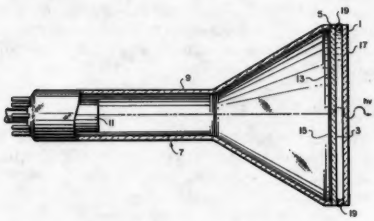
Int. Cl.[4] H01J *31/00, 5/16*

U.S. Cl. 313—478 11 Claims

1. A cathode-ray tube device for generating a bright light spot comprising:

a cathode-ray tube including an evacuated envelope, means located within said envelope to generate an electron beam, a phosphor capable of emitting visible light radiation when excited by electrons, positioned within said envelope and in the path of said electron beam, and a transpar-

ent face plate forming part of said envelope and situated in the path of said visible light radiation and, positioned outside of the outer surface of said face plate and in the path of said visible light radiation, a light beam filtering means comprising, in a container which at least in the path of said light radiation, is transparent to said radiation and

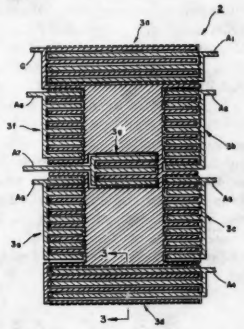


which comprises as a visible light radiation exit member a glass end plate, a light filtering solution containing in addition to light filtering ingredients, as index of refraction raising ingredients, a compound selected from the group consisting of cinnamic alcohol and cinnamaldehyde and mixtures thereof in an amount sufficient to form a concentrated solution thereof.

4,617,491
FLUORESCENT DISPLAY DEVICE WITH INTERLEAVED ANODE AND CONTROL ELECTRODE SEGMENTS

Takao Kishino; Ikuo Marushima, and Nobumitsu Kanetsuna, all of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan

Filed Jul. 13, 1983, Ser. No. 513,389
Claims priority, application Japan, Jul. 16, 1982, 57-124873; Jul. 27, 1982, 57-114270[U]; Aug. 17, 1982, 57-142258
Int. Cl.[4] H01J *31/15*
U.S. Cl. 313—497 **4 Claims**

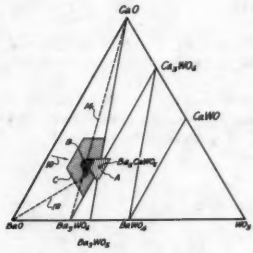


1. A fluorescent display device comprising:
a substrate;
at least one display section formed on said substrate, said display section consisting of a plurality of segments; and
a cathode spaced from said segments;
means for maintaining an evacuated space between said cathode and said segments and for permitting external viewing of said segments;
said segments each comprising anode electrodes and control electrodes alternately arranged in a pectinate configuration with interleaved portions on one surface of said substrate and with an insulating space being interposed therebetween;
said anode electrodes each having a phosphor layer deposited on the surface thereof opposite to said cathode;
said control electrodes each having a phosphor layer deposited on the surface thereof opposite to said cathode;
wherein all of said anode electrodes are connected together to an external terminal in every segment and all of said control electrodes are connected together to an external terminal in every display section.

4,617,492
HIGH PRESSURE SODIUM LAMP HAVING IMPROVED PRESSURE STABILITY

Krishan L. Luthra, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 4, 1985, Ser. No. 698,512
Int. Cl.[4] H01J *17/04;* H01B *1/06*
U.S. Cl. 313—630 **6 Claims**

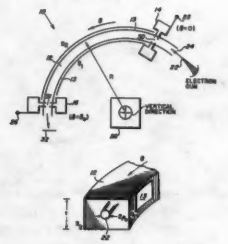


1. As an electron emission mix for a sodium vapor lamp the composition corresponding to points within the shaped areas B and C of the triaxial plot of FIG. 3 multiphase compositions derived from CaO, BaO and WO_3.

4,617,493
COLLECTIVE INTERACTION KLYSTRON

Yue-Ying Lau, Silver Spring, Md., assignor to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 28, 1985, Ser. No. 695,327
Int. Cl.[4] H01J *25/02*
U.S. Cl. 315—5 **20 Claims**



1. A klystron comprising:
a curved drift tube which is curved sufficiently to induce the negative mass effect; said drift tube having a center of curvature, an arc length, an input end and an output end;
at least one input cavity located at the input end of said drift tube;
an output cavity located at the output end of said drift tube; and
means for having electrons which enter said drift tube follow a curved path defined by the shape of the drift tube.

15. A method for increasing the strength of an RF signal comprising the steps of:

aiming an electron beam into an input end of a klystron which has a curved drift tube with a center of curvature and an arc length, and a curve following means which causes the electron beam to follow a path defined by the shape of the curved drift tube;

inputing an RF signal into the klystron through an input cavity of the klystron so the electron beam is modulated by the input cavity as it passes through a gap in the input cavity; and

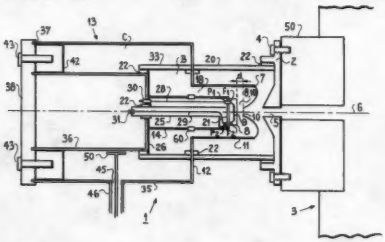
producing an output RF signal proportional to but stronger in amplitude than the inputed RF signal by means of an output cavity that resonates in response to a first or fundemental harmonic of the modulated electron beam as the electron beam passes through a gap in the output cavity.

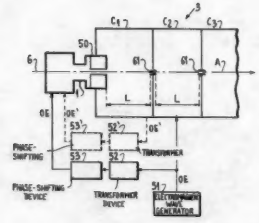
4,617,494

ELECTRON GUN FOR A LINEAR ACCELERATOR AND ACCELERATING STRUCTURE INCORPORATING SUCH A GUN

Hubert P. Leboutet, St. Cloud, and Jeanne J. Aucouturier, L'Hay-Les-Roses, both of France, assignors to CGR-MEV, Buc, France

Filed Dec. 16, 1983, Ser. No. 562,442
Claims priority, application France, Dec. 21, 1982, 82 21399
Int. Cl.[4] H01J *25/10*
U.S. Cl. 315—5.41 **6 Claims**





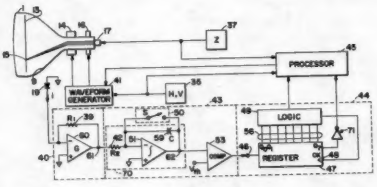
1. A linear accelerator device comprising an electron gun, an accelerating structure, and means for providing an electromagnetic wave; said gun comprising a cathode able to generate an electronic current, a grid able to control said current, and anode perforated by a hole centered around an axis along which are emitted electrons, a cavity resonator closed on a cathode-grid space, said cavity resonator containing an electromagnetic coupling member connectd to a transmission line and making it possible to inject an electromagnetic wave of frequency F into said cavity resonator in order to resonate the latter and excite the cathode-grid space so as to determine between the grid and the cathode, an alternating potential difference of frequency F by which is modulated the electronic current; said accelerating structure comprising at least one accelerating cavity connected to said electron gun for receiving therefrom said electron current, means for injecting into said accelerating cavity an electromagnetic wave at said frequency F, said frequency F being the same as the frequency F injected into said cavity resonator of said electron gun and phase shifting means for controlling the phase of the electromagnetic wave injected into the cavity resonator of the electron gun and the electromagnetic wave injected into the accelerating cavity of the accelerating structure; whereby the electrons from the gun are emitted in pulses or clusters which coincide in said accelerating cavity with an accelerating half-period of said electromagnetic wave for accelerating said electrons.

4,617,495

AUTOCONVERGENCE OF A CATHODE RAY TUBE USING A SEMICONDUCTOR DETECTOR

Robert G. Culter, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Dec. 24, 1984, Ser. No. 685,420
Int. Cl.[4] H01J *31/26*
U.S. Cl. 315—10 **23 Claims**



1. A cathode ray tube calibration system comprising:

a cathode ray tube having:

a display screen;

electron gun means for producing an electron beam directed toward said display screen;

feedback means having an active surface disposed proximately to said display screen at a preselected location such that said electron beam can be directed to strike at least a portion of said active surface, for providing a feedback signal which is related to the area of said portion that is struck;

detector means for detecting said feedback signal and for providing a second signal in response thereto which is a function of said area of said portion that is struck;

converter means for integrating said second signal and for issuing a digital signal in response thereto;

control means for directing said electron beam to strike a sequence of portions of said active surface thereby evoking a sequence of said feedback signals, a sequence of said second signals, and a sequence of said digital signals, and for determining a location of said feedback means based on said sequence of digital signals.

4,617,496

WARM-UP CIRCUIT WITH TIMED SHUT-OFF OF THE WARM-UP CURRENT

Arthur J. Samodovitz, One Lakeshore Dr. #A-4, Farmington, Conn. 06032

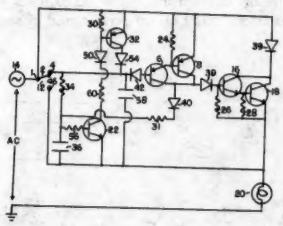
Continuation of Ser. No. 615,289, May 30, 1984, abandoned, which is a continuation-in-part of Ser. No. 583,350, Aug. 18, 1983, abandoned, and a continuation-in-part of Ser. No. 268,724, Jun. 1, 1981, abandoned. This application Jul. 25, 1985, Ser. No. 758,589
Int. Cl.[4] H05B *39/02*
U.S. Cl. 315—208 **33 Claims**

1. A warm-up and switch circuit comprising:

a double throw switch having an off throw contact and an on throw contact;

means responsive to the position of the switch for delivering

a warm-up current from a power source to a load when the switch is in transition, the average power delivered to said load by said warm-up current being substantially less than the average power which could be drawn by said load during the same interval if said load was instead connected by a short circuit directly to said power source;



means for short circuiting said power supply to said load via said on throw contact when the switch is on; and

means for terminating said warm-up current after it has significantly warmed-up said load and said switch is still in transition.

4,617,497

SPINNING OR TWISTING MACHINE CONTROL SYSTEM

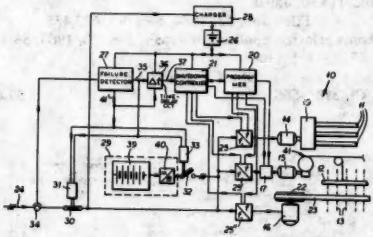
Horst Wolf, Albershausen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach/Fils, Fed. Rep. of Germany

Filed Apr. 1, 1985, Ser. No. 718,163

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1984, 3412060

Int. Cl.[4] H02P *5/46*

U.S. Cl. 318—78 **16 Claims**



1. In a spinning or twisting machine having at least two motors required to drive respective loads with a predetermined speed ratio and energized by a line-current source, the improvement which comprises:

an emergency power supply comprising at least one battery; and

a circuit means operable upon an unforeseeable failure of said line-current source by said emergency power supply to effect a preprogrammed controlled shutdown of one of said motors while energizing at least the other of said motors by said emergency power supply, and maintaining said ratio at least until the speeds of said motors have fallen to a level at which substantial yarn breakage is precluded.

4,617,498

CONTROL DEVICE FOR SYNCHRONIZING A PLURALITY OF DRIVING UNITS

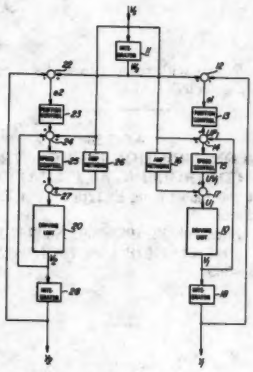
Martin Ruppert, Duisburg, Fed. Rep. of Germany, assignor to BSO Steuerungstechnik GmbH, Sulzbach, Fed. Rep. of Germany

Filed Mar. 22, 1985, Ser. No. 715,087

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1984, 3411651

Int. Cl.[4] H02P *5/46*

U.S. Cl. 318—85 **6 Claims**



1. A control device for synchronizing a plurality of driving units such as a plurality of hydraulic cylinders, each driving unit being actuated by an actuating means such as by a proportional valve, comprising

(a) an integrating means receiving a time-variable, desired speed signal for producing a desired position signal, said integrating means being common for all of said driving units, and further comprising for each individual driving unit,

(b) a comparing means for comparing said desired position signal and an actual position signal from the correlatdd unit for generating a first error signal,

(c) a positional control means receiving said first error signal and generating a control signal,

(d) an amplifying network receiving said desired speed signal and generating an amplified signal compensating for a time delay caused by a transient response of the correlated unit including the correlated actuating means and

(e) an adding means receiving and summing said amplified signal and said control signal for producing a second error signal fed to said actuating means.

4,617,499

BRUSHLESS MOTOR

Masami Yuasa, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 21, 1985, Ser. No. 800,293

Claims priority, application Japan, Nov. 29, 1984, 59-252181

Int. Cl.[4] H02K *29/00*

U.S. Cl. 318—254 **7 Claims**

1. A brushless motor comprising:

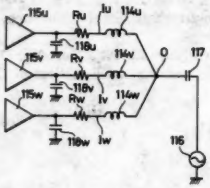
a magnet having a plurality of pole faces;

a plurality of conductors mounted adjacent to said pole faces;

a plurality of phase coils connected together at a neutral point, one of said magnet and said phase coils being included in a movable motor element and the other being included in a stationary motor element; and

a high-frequency signal source for supplying a high-fre-

quency signal to said neutral point, whereby changes in eddy current loss and thus the position of said movable



motor element with respect to said stationary motor element are detected.

4,617,500

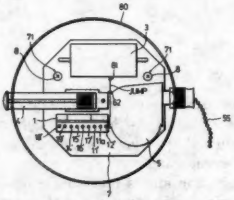
WIRING CONSTRUCTION OF A CONTROL SWITCH CONTROLLING A CEILING FAN

Dick Y. Hsu, 60 Liao Chung E. 12th St, Pei Tun District, Taichung, Taiwan

Filed Jul. 22, 1985, Ser. No. 757,254

Int. Cl.[4] H02P *7/40*; H05K *1/18*

U.S. Cl. 318—305 **3 Claims**



1. A wiring construction of a control switch controlling a ceiling fan, said control switch being manually operated by a cord hanging from said control switch, said wiring construction comprising:

connecting means having two power source contacts and three connective contacts arranged systematically on a printed circuit board with its three connective contacts connected to a first end and a second end of a first winding of the drive motor driving said ceiling fan and to a tapping of the winding respectively;

a condenser connected to one of said power source contacts, and to said first end of said first winding respectively through said connecting means; and

a speed selecting switch acutated by said cord, and connected to said second end of the first winding, to said tapping, and to the other power source contact respectively through said connecting means, for selecting different turns of said first winding to couple to the power source, so that the ceiling fan can rotate at different speeds.

4,617,501

CONTROL AND SAFETY SYSTEM FOR ELECTRICALLY POWERED SUBMERSIBLE TOOLS AND LIGHTS

Franklin W. Smith, King County, Wash., assignor to John D. Gieser and Douglas Foreman, both of Bellevue, Wash.

Filed Sep. 19, 1985, Ser. No. 777,845

Int. Cl.[4] H02H *3/20*

U.S. Cl. 318—459 **25 Claims**

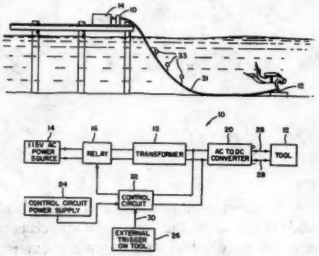
1. A control system for electrically powering from an external alternating-current power source, a hand-operated, submersible light or tool activated by a control switch, comprising:

power switching means selectively controllable responsive to the control switch of the light or tool for connecting and disconnecting the external alternating-current power source to and from the system;

transformer means connected to said power switching means for transforming the alternating current power of the source to a desired lower voltage level;

conductive means for supplying the power to the tool; and

control means for sensing the voltage level of the transformed alternating-current power, and in response to the



sensed voltage level increasing above a predetermined level, for controlling said power switching means to disconnect the external alternating-current power source from the system, whereby the lower voltage alternating-current output of said transformer means is monitored and used to control the application of the higher voltage alternating-current to the system to prevent overvoltages on the output of said transformer means and thus the light or tool.

4,617,502

METHOD AND APPARATUS FOR CONTROLLING A ROBOT HAND ALONG A PREDETERMINED PATH

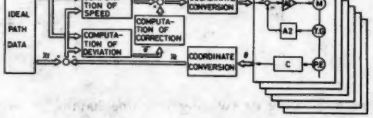
Shiyuki Sakaue, Yokohama; Koichi Sugimoto, Hiratsuka, and Shinichi Arai, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 22, 1984, Ser. No. 623,455

Claims priority, application Japan, Jun. 30, 1983, 58-116995; Jan. 25, 1984, 59-10038

Int. Cl.[4] G05B *19/42*

U.S. Cl. 318—568 **35 Claims**



1. A method of controlling a robot hand along a predetermined path at a predetermined speed, comprising the steps of:

obtaining positional information and speed information of the robot hand during sampling operations as the hand endeavors to traverse the predetermined path;

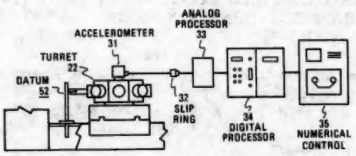
determining a command speed value of the robot hand on the basis of the positional information and the speed information; and

using the command speed value to control a drive system of the robot hand to correct positional deviation of the robot hand from the predetermined path and speed deviation of the robot hand from the predetermined speed.

4,617,503
ACTIVE DATUM FOR COORDINATE REFERENCE IN A NUMERICALLY CONTROLLED MACHINE TOOL

Richard K. Davis, Charlottesville, Va.; Clayton R. Roberts, Syracuse, and Stephen W. Tehon, Clay, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Nov. 26, 1985, Ser. No. 801,823
Int. Cl.⁴ G05B *19/24*
U.S. Cl. 318—572 **14 Claims**



1. In an apparatus for precisely locating the cutting surface of a positionable cutter in relation to the coordinate reference system of a machine tool, the combination comprising

A. an active datum having a vibratory planar reference surface at a known position in relation to said coordinate reference system, said vibration ocurring at ultrasonic frequencies with displacements that are small in relation to the desired positional accuracy, said datum comprising

(1) an elongated first member, a lateral surface portion thereof providing said vibratory planar reference surface, said member being extensionally vibratory in a desired mode established along the longitudinal axis thereof with an antinodal region at either end and at least one nodal region at an intermediate position along said longitudinal axis, Poisson coupling causing a significant vibratory surface motion orthogonal to said longitudinal axis, one or both of said motions being present throughout said lateral surface portion

(2) a support for attaching said first member at the nodal region of said desired mode to favor said mode with minimum energy transmission of said extensional component via said support to said machine tool, said support being sufficiently compliant to surface motion orthogonal to said longitudinal axis to permit vibrations in said desired mode and relatively rigid with respect to flexural motion to maintain accuracy of said lateral surface portion in relation to said support and to suppress flexural vibrations, said support being attached to said machine tool so that said vibratory planar reference surface is at a stable position in relation to said coordinate reference system, and

(3) electromechanical transducer means applied to said elongated member for exciting vibration in said desired mode and

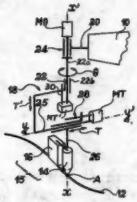
B. an acoustic accelerometer sensor acoustically coupled to said cutter for producing an electrical output signal in response to said vibrations when said cutter contacts said planar reference surface to indicate contact and thereby the cutter position in said coordinate reference system, said acoustic sensor being substantially uncoupled acoustically from said datum in the absence of such contact.

4,617,504
POSITIONING DEVICE

Jean-Marie Détriché, Montesson, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 22, 1984, Ser. No. 663,403
Claims priority, application France, Oct. 20, 1983, 83 16701
Int. Cl.⁴ G05B *19/33;* B23K *19/12*
U.S. Cl. 318—576 **6 Claims**

1. A device for positioning a tool incorporating a tool holder for fixing said tool to the end of a carrier able to move in accordance with a stored path for carrying out, on the basis of the detection of a true path to be followed by the tool, tool path corrections with respect to the stored path, said tool holder supporting a position detector displaced in the direction of the stored path relative to an active centre of the tool via means for displacing the detector in a direction permitting a setting thereof on the true path, a first feedback or control circuit being associated with the position detector and controlling said means for displacing the detector, wherein the device also comprises an orientation detector, the detectors being rigidly fixed to the tool in order to form a working head there-

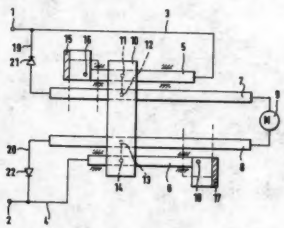


with, said means for displacing the detector being translation means for displacing the working head in a direction orthogonal to the plane passing through the ends of the detector and through the active centre of the tool, rotation means being provided for rotating the working head and the translation means about an axis contained in the plane and passing through the active centre of the tool, a second feedback or control circuit being associated with the orientation detector and controlling said rotation means.

4,617,505
VOLTAGE SUPPLY

Andreas Sausner, Frankfurt am Main, and Gerhard Ruschek, Hattersheim, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 12, 1985, Ser. No. 722,958
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1984, 3414211
Int. Cl.⁴ G05G *5/00*
U.S. Cl. 318—626 **4 Claims**



1. A voltage supply for a servomotor which is operative between limit stops and moves a member toward at least one stop, the supply having a wiper with two wiper contacts which slide on two spaced-apart conductive elements which serve as two electrically conductive paths, the two conductive paths being connected to a source of voltage and supplying the servomotor with voltage, and wherein at least one wiper contact of the wiper is displaceable beyond at least one end of one of the conductive paths in order to disconnect the servomotor, the improvement wherein

at least one of said conductive paths is displaceable in a longitudinal direction and has a driver mounted thereon, said wiper urging said driver to drive the conductive path

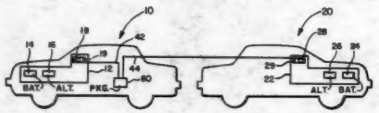
as soon as the wiper contact is outside of the conductive path.

4,617,506

BATTERY CHARGING APPARATUS AND METHODS

Jon R. Bogie, Evanston, and Edward A. Quillen, St. Charles, both of Ill., assignors to Wiltronix Corporation, Evanston, Ill.

Filed Aug. 31, 1984, Ser. No. 646,571
Int. Cl.[4] H01R *11/00*; H02J *7/00*; G01N *27/42*
U.S. Cl. 320—2 11 Claims



1. A method for determining whether a battery in a first vehicle is charged from the electrical system of a second vehicle comprising the steps of:

providing electronic means having inputs adapted to be coupled to said battery and said electrical system, respectively, circuit means coupled to said inputs, and an array of illuminatable display means, coupled to said circuit means, the number of said display means in said array that are illuminated being indicative of the extent to which said battery has been charged;

coupling said electrical system to one of said inputs and coupling said battery to another of said inputs; and

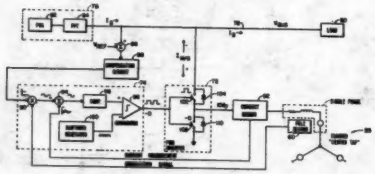
periodically interrogating said electronic means by momentarily isolating said electrical system from said circuit means to ascertain the number of said display means in said array that are illuminated.

4,617,507

SELF-REGULATING ENERGY STORAGE SYSTEM

David B. Eisenhaure, Hull; James R. Downer, Cambridge; Tim E. Bliamptis, Lexington; George A. Oberbeck, East Walpole, all of Mass., and Susan D. Hendrie, Milan, Italy, assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Dec. 19, 1984, Ser. No. 683,373
Int. Cl.[4] H02K *7/02*
U.S. Cl. 322—4 5 Claims



1. A self-regulating energy storage system comprising:

an a.c. motor/generator including a rotor;

a flywheel attached to said motor/generator;

means for monitoring the position of the motor/generator rotor;

means for resolving current to and from said motor/generator;

a pulse width modulated bidirectional inverter interconnecting said motor/generator with a power supply bus having a voltage to be regulated;

a summing circuit for determining differences between a reference voltage and the voltage on the power supply bus to be regulated; and

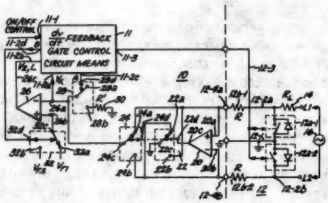
a pulse width modulation switch control responsive to said summing circuit, to said means for monitoring, and to said means for resolving, for actuating said inverter to increase pulse width as function of increase in the difference between the reference voltage and the voltage on the bus and to increase current to said motor/generator when the bus voltage exceeds the reference voltage and to increase current from said motor/generator when the reference voltage exceeds the bus voltage.

4,617,508

REVERSE PHASE-CONTROL APPARATUS FOR MULTIPLEXING INTERCONNECTIONS BETWEEN POWER SWITCHING AND CONTROL CIRCUIT MODULES

Milton D. Bloomer, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 2, 1984, Ser. No. 667,926
Int. Cl.[4] G05F *1/445*
U.S. Cl. 323—237 21 Claims



1. Multiplexing apparatus for interconnecting a power switching module, having at least one switching device controlled into a saturated conductive condition responsive to a conduction control signal and connected to a load for controlling a flow of current therethrough from an AC source, with a control circuit means for providing said control signal to said switching module only if an auxiliary "on" control signal is provided, including:

first and second multiplexing apparatus terminals;

first and second substantially resistive elements, each connected between a different one of said first and second apparatus terminals and a different one of first and second opposed ends of the load-source series circuit;

first means, including: a first comparator having first and second inputs each connected to a different one of said first and second apparatus terminals, and an output providing a signal at one of first and second conditions responsive to one of said inputs being at a potential greater than the potential at the other input; and a pair of switch means, each having a common terminal controlled responsive to the first comparator output first and second conditions into connection between a different one of first and second selectable terminals; the first selectable terminal of a first one of said pair of switch means and the second selectable terminal of a second one of the pair of switch means being connected together in parallel to one of said first and second apparatus terminals, the second selectable terminal of said first switch means and the first selectable terminal of said second switch means being connected in parallel to the other of said apparatus terminals, the common terminal of one of said pair of switch means being connected to a circuit common potential, and the common terminal of the other of said pair of switch means multiplexing both half-cycles of the AC signal waveform, between said first and second apparatus terminals, as a first signal with a common preselected polarity;

means, responsive to the respective first and second conditions of a first logic signal, for providing a respective one of a first reference potential having the preselected polarity and a substantially zero magnitude and a second reference potential having the preselected polarity and a non-

zero magnitude selected to be not greater than a saturation voltage of said switching module;

second means for providing a zero-crossing turn-on drive signal to said control circuit means at a first condition whenever said first signal is at a magnitude less than the substantially zero magnitude of the first reference potential, to cause said control circuit means to provide said control signal during each of the source signal waveform half-cycles responsive to the presence of both said zero-crossing signal and said auxiliary "on" signal; and

third means, cooperating with at least said resistive elements and said first means, for monitoring the conduction condition of said at least one switching device to cause said control circuit means to remove said conduction control signal if said at least one switching device leaves the saturated conduction condition.

4,617,509

VOLTAGE REGULATOR FOR A MICROCOMPUTER SYSTEM

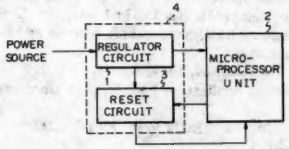
Naoki Tomisawa, Isesaki, Japan, assignor to Japan Electronic Control Systems Company Limited, Japan

Continuation-in-part of Ser. No. 399,694, Jul. 19, 1982, abandoned. This application May 2, 1984, Ser. No. 607,395

Claims priority, application Japan, Jul. 21, 1981, 56-114293

Int. Cl.[4] G05F *5/00*

U.S. Cl. 323—303 **3 Claims**



1. A voltage regulator for a microprocessor unit comprising:

a regulator means for receiving an input voltage from a power supply and in response supplying a regulated voltage to the microprocessor unit which produces run signals at a regular rate during executing program steps normally, said regulated voltage having a particular rise time following turn on of the power supply; and

a reset means for applying a reset signal to the microprocessor unit upon receipt of a power supply current and if the frequency of said run signal is out of a normal range, said reset means receiving a voltage from said regulator means and producing the reset signal having a duration sufficiently longer than a period in which the regulated voltage applied to the microprocessor unit is raised to a steady state level after turn on of the power supply.

4,617,510

TESTING INSTALLATION FOR ELECTRIC CIRCUITS OF A MOTOR VEHICLE

Axel Deicke, Baldham, and Michael Tigges, Freising, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke AG, Fed. Rep. of Germany

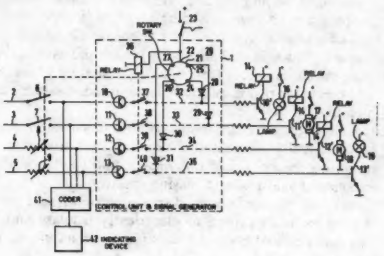
Filed Oct. 5, 1983, Ser. No. 538,802

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1982, 3237164

Int. Cl.[4] G01R *31/02*

U.S. Cl. 324—51 **11 Claims**

1. A test installation for testing different load means of electric circuits of a motor vehicle comprising a control unit for receiving input signals and for producing test signals, said control unit including converter means for converting said input signals into output signals for switching said different load means and generator means (20) including interrupting means (36) for interrupting said input signals and for producing test signals independently of the input signals and at least similar to the output signals and for cyclically supplying said



test signals to the load means when interrupting said input signals.

4,617,511

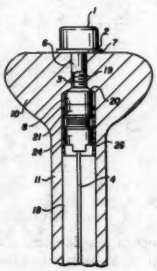
ELECTRODE PROBE ASSEMBLY FOR GLASS LINED METAL VESSELS

Myles A. Shaftel, Rochester, N.Y., assignor to Kennecott Corporation, Cleveland, Ohio

Continuation of Ser. No. 644,133, Aug. 23, 1984, abandoned, which is a continuation of Ser. No. 387,915, Jun. 14, 1982, abandoned, which is a continuation of Ser. No. 135,671, Mar. 31, 1980, abandoned. This application Aug. 8, 1985, Ser. No. 764,505

Int. Cl.[4] G01R *31/12, 27/02;* **G01N** *27/28*

U.S. Cl. 324—54 **5 Claims**



1. An electrode probe assembly for use with a metal vessel having a glass lined inner wall surface, comprising:

(a) an electrode formed from a blind metal nut, platinum plated, and having an internal screw threaded aperture extending into but not through said nut;

(b) a lip member extending from the periphery of said nut and from that face of said nut into which said aperture extends, forming a cup of the combination of said nut and said lip member;

(c) an elongated threaded metal stud having a first end threaded into said internal screw thread of said aperture; said stud being adapted to extend through a bore in a mounting member for said electrode probe assembly;

(d) an insulating gasket disposed around said stud, adapted to be positioned between said lip member and an adjacent surface of said mounting member;

(e) a hub means disposed around said stud, having a butress surface adapted to butress against an opposed surface of said mounting member, said opposed surface which is located remote from said adjacent surface of said mounting member;

(f) insulation washer means, disposed around said stud, posi-

tioned against said hub means and located remote from said butress surface of said hub means, adapted to electrically insulate and separate said hub means from;

(g) resilient biasing means, disposed around said stud, adapted to continuously exert pressure linearly along the axis of said stud to force said hub means along said axis of said stud towards said insulating gasket and said nut and to urge said lip member towards said insulating gasket when said electrode probe assembly is mounted in said mounting member;

(h) insulating tube means disposed around said stud, adapted to electrically insulate and separate said stud from said mounting member, said hub means, said insulation washer means and said resilient biasing means;

(i) insulating sleeve means, disposed around said resilient biasing means, adapted to electrically insulate and separate said resilient biasing means from said mounting member; and

(j) means, mounted to the second end of said stud, for electrically connecting said stud to an electrical circuit.

4,617,512

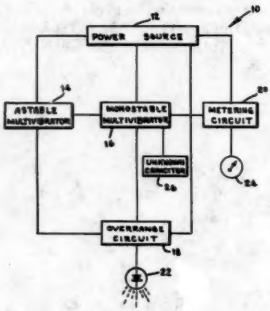
CAPACITANCE MEASURING DEVICE INCLUDING AN OVERRANGE CIRCUIT

Joseph L. Horner, 76 Brattle St., Cambridge, Mass. 02138

Filed Jul. 5, 1983, Ser. No. 511,076

Int. Cl.⁴ G01R *27/26*

U.S. Cl. 324—60 CD **7 Claims**



1. A capacitance measuring device for determining the capacitance value of an unknown capacitor, said capacitance measuring device comprising:

means for generating a repetitive series of evenly spaced pulses;

means, having said unknown capacitor electrically connected thereto, for receiving said repetitive pulses, each of said pulses initiating a voltage output from said pulse receiving means, said voltage output from said pulse receiving means remaining in a high state for a length of time linearly proportional to said capacitance value of said unknown capacitor, and thereafter said voltage output reverting to a low state and remaining at said low state for the length of time it takes said pulse receiving means to receive the next one of said repetitive pulses;

metering means for receiving said output voltage from said pulse receiving means and averaging said high and low states of said voltage output, said metering means having a preselected full scale range, said metering means providing a first average voltage reading indicative of said capacitance value of said unknown capacitor when the length of time of said voltage output from said pulse receiving means is equal to or less than the length of time between said evenly spaced pulses, said metering means providing a second average voltage reading indicative of said capacitance value of said unknown capacitor when the length of time of said voltage output from said pulse receiving means is greater than the length of time between said evenly spaced pulses, both said first average voltage reading and said second average voltage reading falling within said full scale range of said metering means, said first average voltage reading being a true indication of said capacitance value of said unknown capacitor, and said second average voltage reading being a false indication of said capacitance value of said unknown capacitor; and said pulse generating means and said pulse receiving means including means for varying said preselected full scale range of said metering means; and

means operably connected between said pulse receiving means and said metering means for distinguishing between said first average voltage reading and said second average voltage reading and providing a signal when said second average voltage reading is present, and said means for providing a signal when said second average voltage reading is present including a plurality of NAND gates, a diode connected to one of said plurality of NAND gates, a transistor connected to said diode, a capacitor connected between said diode and said transistor, a resistor connected to said transistor and a light emitting diode connected to said resistor;

whereby said false indication for capacitance value can be disregarded.

4,617,513

MEASUREMENT DEVICE FOR USE IN HIGH-VOLTAGE GAS-INSULATED SWITCH GEAR

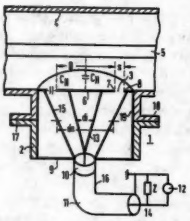
Hans-Jüergen Reinhardt, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

Filed Jul. 24, 1984, Ser. No. 633,829

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1983, 3327917

Int. Cl.⁴ H01H *9/50*; H01G *1/00*

U.S. Cl. 324—126 **8 Claims**



1. A measurement device for use in high-voltage, compressed gas-insulated switchgear, the device being of a type in which a capacitive voltage divider is formed by a high-voltage capacitor and a low-voltage capacitor,

the high voltage capacitor being formed by an inner conductor mounted with insulation in a metal capsule filled with compressed gas and an electrode mounted with insulation in an opening in the capsule and

the low-voltage capacitor being formed by said electrode and an edge of said opening,

the device being connectable with display/measurement apparatus by a coaxial measuring cable with a characteristic impedance, the device comprising:

a dish-shaped electrode located flush in said opening;

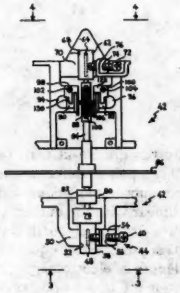
a terminal element having a fastening flange by which it is attached to the capsule and containing the electrode and said edge, the terminal element being a supporting component and further comprising a hollow conical outer connecting element extending to said edge and an inner conical connecting element extending to the electrode, said connecting elements being coaxial and having a constant ratio d_a/d_i where d_a is a diameter of the outer connecting

element and d_f is a corresponding diameter of the inner connecting element, whereby said connecting elements have said characteristic impedance of the coaxial measuring cable.

4,617,514
DISK AND GEAR MOUNTING IN ELECTRIC WATTHOUR METER

Donald F. Bullock, Somersworth; Austin F. Wilson, Rochester; Marshall A. Lemay, Hampton Falls, and David B. Miles, Dover, all of N.H., assignors to General Electric Company, Somersworth, N.H.

Filed Mar. 14, 1985, Ser. No. 711,642
Int. Cl.[4] G01R *11/02;* **F16C** *23/02, 27/02*
U.S. Cl. 324—137 **7 Claims**



1. A system for mounting rotatable elements in an electric watthour meter comprising:

a watthour meter frame;

a first horizontal machined surface and a first vertical machined surface at a first end of said frame;

a first disk bearing;

a first cylindrical surface on said first disk bearing;

first means for urging said first cylindrical surface into rigid contact with said first horizontal machined surface and said first vertical machined surface whereby said first disk bearing is positioned and secured thereby;

a second horizontal machined surface and a second vertical machined surface at a second end of said frame;

a second disk bearing;

a second cylindrical surface on said second disk bearing;

second means for urging said second cylindrical surface into rigid contact with said second horizontal machined surface and said second vertical machined surface whereby said second disk bearing is positioned and secured thereby;

a disk shaft rotatably supported by said first and second disk bearings; and

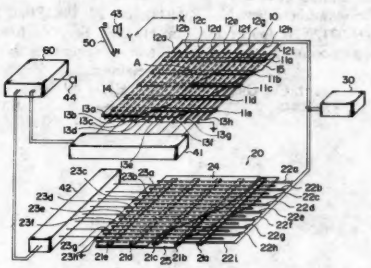
means in said watthour meter frame for permitting machining of said first and second horizontal machined surfaces and said first and second vertical machined surfaces without requiring rotation of said watthour meter frame, whereby improved positioning accuracy of said first and second disk bearings is achieved.

4,617,515
POSITION DETECTING APPARATUS

Yoshinori Taguchi, and Tsuguya Yamanami, both of Ageo, Japan, assignors to Wacom Co., Ltd., Japan

Filed Feb. 22, 1985, Ser. No. 704,223
Claims priority, application Japan, Feb. 22, 1984, 59-32244; Feb. 23, 1984, 59-33083
Int. Cl.[4] G01B *7/14*
U.S. Cl. 324—207 **6 Claims**

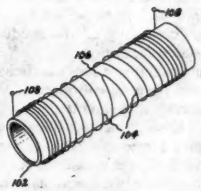
2. A position detecting apparatus comprising: an X-direction position detecting section having a plurality of elongated magnetic bodies arranged substantially in parallel, and a plurality of exciting lines and detecting lines which are arranged alternately such as to orthogonally cross said elongated magnetic bodies; a Y-direction position detecting section having a construction similar to that of said X-direction position detecting section and superposed thereto; a driving current source adapted to apply A.C. currents of a predetermined frequency to the exciting lines in said X- and Y-direction position detecting sections; a position appointing magnetism generator adapted for applying local magnetic bias to said magnetic bodies of said X- and Y-direction position detecting sections; X- and Y-direction signal selecting means connected to said detecting lines of said X- and Y-direction position detecting sections; and a processing means for computing the coordinate position appointed by said position appointing magnetism generator from the induced voltage derived from said X- and Y-direction signal selecting means.



4,617,516
AXIAL MAGNETIC FIELD GRADIENT COIL SUITABLE FOR USE WITH NMR APPARATUS

John F. Schenck, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 6, 1983, Ser. No. 529,431
Int. Cl.[4] G01R *33/08*
U.S. Cl. 324—318 **13 Claims**



1. A cylindrical coil for providing a magnetic field gradient varying substantially linearly in a direction parallel to the axis of said coil within the interior volume thereof, said coil comprising;

a non-magnetic cylindrical coil support structure having an open bore forming said interior volume, and

a single electrically conductive cylindrical winding having a plurality of connected turns disposed on the surface of said coil support structure, said winding turns being electrically spaced from each other and symmetrically disposed about, and with the winding direction thereof being reversed at, the center of said cylindrical coil support structure with the axial density of said winding turns being at a minimum at the center of the length of said coil and linearly increasing from the center to each axial end of said coil; said winding turns forming, in the interior volume and responsive to the value of a current I caused to

flow in a single common direction therethrough, an axial magnetic field with the desired substantially linearly varying gradient.

4,617,517

DETERMINATION OF WATER SATURATION IN EARTH FORMATIONS INDEPENDENT OF LITHOLOGY

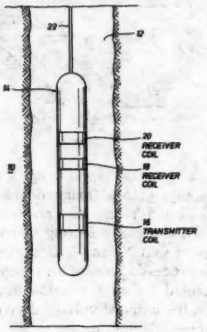
Walter H. Fertl, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 340,911, Jan. 20, 1982, Pat. No. 4,494,071. This application Jun. 11, 1984, Ser. No. 619,088

The portion of the term of this patent subsequent to Jan. 15, 2002, has been disclaimed.

Int. Cl.[4] G01V *3/12, 3/30;* E21G *49/00*

U.S. Cl. 324—338 **9 Claims**



1. A method for determining the water saturation of subsurface earth formations traversed by a borehole, substantially independent of salinity contrasts and lithology comprising steps of:

traversing a borehole with a logging instrument to obtain first measurements functionally related to the electric permittivity of the formations surrounding said borehole, wherein said electric permittivity is functionally related to the reservoir porosity, water filled porosity, hydrocarbon filled porosity and rock matrix;

injecting into said formations an oil miscible solution to displace substantially all the residual fluids contained in said measured formations;

injecting into said formations a sufficient amount of water to render said measured formations substantially one hundred percent water saturated;

traversing said borehole with a logging instrument to obtain second measurements functionally related to the electric permittivity of said measured formations, wherein said electric permittivity is functionally related to the reservoir porosity, water filled porosity and rock matrix; and

combining said first and said second measurements to determine the water saturation for said measured formations substantially independent of salinity contrasts and lithology.

4,617,518

METHOD AND APPARATUS FOR OFFSHORE ELECTROMAGNETIC SOUNDING UTILIZING WAVELENGTH EFFECTS TO DETERMINE OPTIMUM SOURCE AND DETECTOR POSITIONS

Leonard J. Srnka, Houston, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Filed Nov. 21, 1983, Ser. No. 554,032

Int. Cl.[4] G01V *3/06, 3/15*

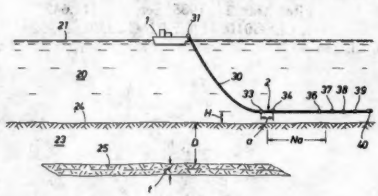
U.S. Cl. 324—365 **15 Claims**

1. A method for surveying and characterizing a region of an earth formation beneath a body of water having a surface and a floor, said region extending to a first depth below the floor, comprising the stpps of:

positioning an electric dipole current source, including a pair of source electrodes separated by a first distance, substantially parallel to the surface of the body of water and separated from the floor by a second distance, the second distance being less than approximately one-fourth of the distance between the surface and the floor;

causing alternating electric current to flow in the source, said current including a first sinusoidal component having a selected frequency;

measuring a current characteristic of said current;



contemporaneously positioning at least one electric dipole detector, including a pair of detector electrodes separated by a third distance substantially equal to said first distance, substantially collinear with the current source and spaced from the current source by a fourth distance, where said fourth distance is approximately equal to an integral multiple of the wavelength of electromagnetic radiation having said selected frequency in the body of water;

measuring a characteristic of the potential difference between the pair of detector electrodes; and

determining a characteristic of the complex mutual impedance of the current source and the at least one dipole detector from said current characteristic and said potential difference characteristic.

4,617,519

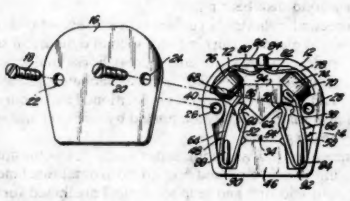
TESTING DEVICE FOR A FLUORESCENT LAMP AND LAMP HOLDER

Eric Rosenthal, 66-22 Fleet St., Forest Hills, N.Y. 11375

Filed Oct. 26, 1983, Ser. No. 545,526

Int. Cl.[4] G01R *31/02*

U.S. Cl. 324—414 **11 Claims**



1. A fluorescent lamp testing device comprising:

a portable housing having a flat front wall and an end wall adjacent to said front wall;

an opening provided in said side end wall and extending into said front wall as a Y-shaped cutout to define an entry port in said end wall connected to bifurcated open first and second paths in said front wall, ends of said first and second paths being remote from said entry port and providing first and second receptacles, respectively, for receiving therein a pair of tube pins disposed at one end of a fluorescent lamp;

said first and second receptacles being spaced apart a greater distance than transverse spacing across said entry port so that the pair of tube pins are passed one at a time through said entry port with one tube pin being inserted into said

first receptacle and the other tube pin being rotated and inserted into said second receptacle to position the end of the fluorescent lamp in a facing arrangement with said front wall;

a pair of spaced apart first and second contact members disposed in said housing, said first and second contact members including cantilevered first and second arms of springy material respectively;

each of said first and second arms terminating in a bent finger to respectively provide first and second receiving seats facing each other, said first and second receiving seats being positioned inwardly of said first and second receptacles to respectively receive and contact the tube pins when inserted in said first and second receptacles and positioned between said first and second receiving seats;

said first and second receiving seats being biased towards each other to provide a retaining force therebetween for holding and retaining the tube pins when inserted between said first and second receiving seats;

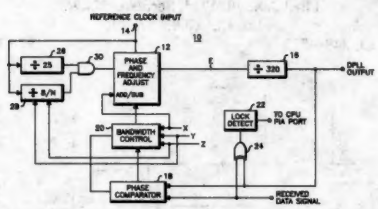
a source of energy in said housing being coupled to said first and second contact members; and

indicator means provided on said housing and connected in a series circuit arrangement with said first and second contact members and said source of energy so that insertion of the tube pins into said first and second receptacles to respectively contact said first and second receiving seats completes a circuit to energize said indicator means when the tube pins are electrically internally connected together thereby verifying operability of the inserted one end of the fluorescent lamp.

4,617,520
DIGITAL LOCK DETECTOR FOR A PHASE-LOCKED LOOP

Stephen N. Levine, Chicago, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 3, 1984, Ser. No. 567,714
Int. Cl.[4] H03D *13/00;* **H03K** *9/06;* **H03L** *7/00*
U.S. Cl. 328—133 **5 Claims**



1. A lock detector for use in a phase-locked loop having an input signal and an output signal having a plurality of half cycles, for producing a lock detector output signal in response to the relative phase of said phase locked-loop input and output signals, comprising:

input means for inputting said phase-locked loop input and output signals;

comparing means coupled to said input means for generating an out-of-phase signal upon said phase-locked loop input and output signals being out-of-phase;

clock means for generating high frequency clock pulses;

gating means coupled to said clock means and said comparing means for gating said high frequency clock pulses to generate clock pulses whenever said out-of-phase signal indicates said phase-locked loop input and output signals are out-of-phase;

first divider means coupled to said gating means for accumulating said gated clock pulses, wherein said first divider accumulates gated clock pulses over a relatively short period;

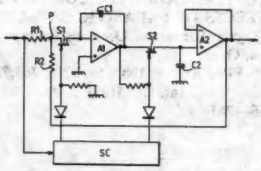
second divider means coupled to said first divider means wherein said second divider accumulates overflow pulses output from said first divider wherein said overflow pulses output from said first divider comprise long period out-of-lock pulses which indicate that said phase-locked loop is out of lock, and are accumulated by said second divider over a relatively long period and each of said first and second divider means being reset periodically, but at different rates respectively; and

lock indicator means coupled to said second divider means for indicating a locked condition in the event said second divider has not accumulated a predetermined number of long period out-of-lock pulses wherein said lock indicator means requires several consecutive long period out-of-lock cycles before using set to indicate an out-of-lock condition.

4,617,521
SAMPLE AND HOLD DEMODULATOR WITH FEEDBACK FOR REDUCED RIFFLE

Ronald W. Fox, Edinburgh, Scotland, assignor to Ferranti plc, Cheshire, England

Filed Jun. 4, 1985, Ser. No. 741,263
Claims priority, application United Kingdom, Jun. 22, 1984, 8416017
Int. Cl.[4] H03D *3/18*
U.S. Cl. 329—50 **6 Claims**

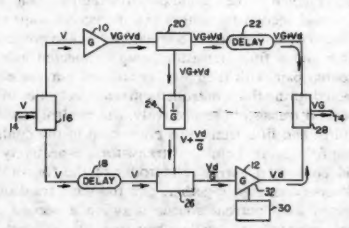


1. A demodulator circuit which includes an integrator having an input connected through a first switch to a summing point to which may be applied a modulated carrier signal, a sample-and-hold circuit comprising a second switch operable at the carrier signal frequency in antiphase with the first switch to connect an output of the integrator to a holding capacitor connected to an input of an operational amplifier having 100% negative feedback, and a feedback connection between the output of the sample-and-hold circuit and the summing point.

4,617,522
TEMPERATURE REGULATED FEEDFORWARD AMPLIFIER

Victor F. Tarbutton; J. Edwin Mitchell, and Robert M. Blumenkranz, all of Brea, Calif., assignors to General Instrument Corporation, New York, N.Y.

Filed Mar. 20, 1984, Ser. No. 591,438
Int. Cl.[4] H03F *1/30*
U.S. Cl. 330—149 **14 Claims**



12. A broad bandwidth, open loop temperature stabilized

feedforward amplifier for use in cable communications systems requiring repeated amplification stages including:

means for receiving a broad bandwidth signal;

main amplifier means electrically attached to the receiving means for amplifying the broad bandwidth signal with uniform gain over the bandwidth and a given temperature to provide an amplified signal, said amplified signal having a distortion component;

error signal means, coupled to said means for receiving and said main amplifier means, for providing an attenuated error signal proportional to said distortion component but having attenuated magnitude and inverted phase relative to said distortion component;

error amplifier means electrically coupled to said error signal means for amplifying the attenuated error signal with uniform gain over the bandwidth at a given temperature;

a power supply electrically connected to and supplying power to the error amplifier means; and

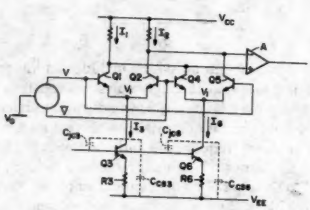
means for regulating the output power of the power supply in response to changes in the ambient temperature to maintain the gain of the error amplifier means relatively uniform over the bandwidth and over a range of temperatures.

4,617,523

DIFFERENTIAL PAIR WITH COMPENSATION FOR EFFECTS OF PARASITIC CAPACITANCE

Stewart S. Taylor, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Aug. 8, 1985, Ser. No. 763,729
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—261 **7 Claims**



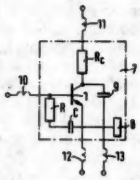
1. An electronic circuit comprising six transistors each having a control electrode and first and second controlled current electrodes, a first and a second transistor being connected as a first differential pair with their control electrodes connected to input terminals of the circuit, the first controlled current electrode of each of the first and second transistors connected to a first reference potential level and the second controlled current electrodes to the two transistors connected together, a third transistor being connected as a current source drawing a first constant current and having its first controlled current electrode connected to the second controlled current electrodes of the first and second transistors and its second controlled current electrode connected to a second reference potential level, a fourth and a fifth transistor being connected as a second differential pair with their first controlled current electrodes connected to the first controlled current electrodes of the first and second transistors respectively, the control electrodes of the fourth and fifth transistors connected to the control electrodes of the second and first transistors respectively and the second controlled current electrodes of the fourth and fifth transistors connected together, and the sixth transistor being connected as a current source drawing a second constant current, substantially smaller than the first constant current, and having its first controlled current electrode connected to the second controlled current electrodes of the fourth and fifth transistors and its second controlled current electrode connected to the second reference potential level.

4,617,524

INTEGRATED AMPLIFIER CIRCUIT HAVING RC NETWORK TO SUPPRESS OSCILLATION

Walter Beckenbach, and Heinz Rinderle, both of Heilbronn, Fed. Rep. of Germany, assignors to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Jul. 11, 1984, Ser. No. 629,629
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1983, 3326958
Int. Cl.[4] H03F *3/04*
U.S. Cl. 330—307 **30 Claims**



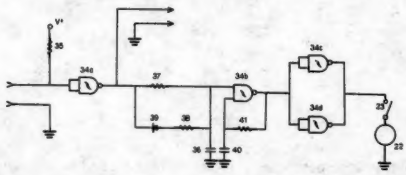
1. An integrated amplifier circuit comprising: a semiconductor substrate; and amplifier transistor having an emitter zone, a base zone, and a collector zone fabricated on the substrate; and an RC network fabricated on the substrate to suppress undesired self-excited oscillations, the RC network being connected between the base zone of the amplifier transistor and the substrate.

4,617,525

SLEEP POSTURE MONITOR AND ALARM SYSTEM

Stephen R. Lloyd, 5642 N. Bernard, Chicago, Ill. 60659

Filed Jan. 30, 1984, Ser. No. 574,969
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—573 **17 Claims**



1. A device for monitoring the sleep posture of a sleeping person comprising:

(a) a sensor to generate a detect signal in response to the sleeping person's adopting a particular sleep posture, said detect signal being terminated upon termination of the person's adopting said particular sleep posture;

(b) means for monitoring the detect signal for diagnostic purposes;

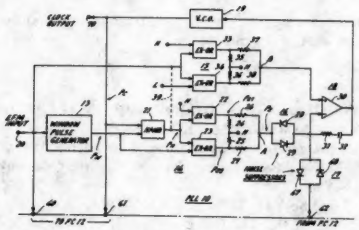
(c) a time-delay circuit coupled to said sensor, for generating an enable signal upon completion of a timing cycle in response to the detect signal, wherein the timing cycle is terminated without generating an enable signal upon interruption of the detect signal prior to completion of the timing cycle, wherein the time-delay circuit is constructed so as to terminate a timing cycle upon interruption of the detect signal if the duration of the interruption is greater than a maximum allowed duration and to continue the timing cycle upon interruption of the detect signal if the interruption is of a shorter duration; and

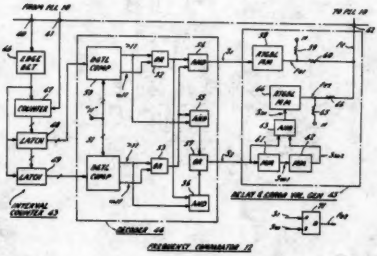
(d) means for monitoring the enable signal, wherein the enable signal is terminated upon termination of the detect signal.

4,617,526
SYNC RESPONSIVE CLOCK GENERATOR FOR DIGITAL DEMODULATORS

Kazuo Hikawa, Tokyo; Kazuya Toyomaki, Zama, and Hiroyuki Yamazaki, Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 25, 1985, Ser. No. 715,246
Claims priority, application Japan, Mar. 26, 1984, 59-57580
Int. Cl.[4] H03L *7/16, 7/20*
U.S. Cl. 331—1 A **26 Claims**





1. A clock generator adapted to receive a digital bit stream having data bits and a synchronization code between prescribed numbers of the data bits, comprising:

a voltage-controlled oscillator for generating clock pulses having a frequency and a phase which are variable in response to an input signal applied thereto;

means responsive to said digital bit stream for generating a window pulse having a pulse duration smaller than the pulse spacing of said clock pulses in response to a predetermined transition binary "1"s and binary "0"s in said bit stream;

a phase comparator responsive to said window and clock pulses for generating a phase control signal representing the difference in phase between said window pulse and said clock pulse;

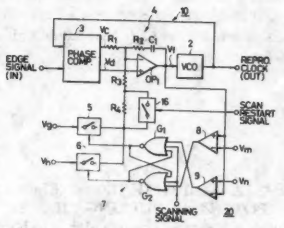
a frequency comparator responsive to said bit stream and said clock pulses for detecting said synchronization code and detecting the clock pulses present during the period of the detected synchronization code and generating a frequency control signal having an amplitude variable as a function of the number of the detected clock pulses; and

means for combining said phase control signal and said frequency control signal and applying the combined signals to said voltage-controlled oscillator as said input signal.

4,617,527
PU LOCK ACQUISITION WITH SCAN RESTART UPON FALSE LOCK

Ryuichi Naitoh, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 507,640, Jun. 27, 1983, abandoned. This application Jun. 13, 1985, Ser. No. 744,649
Claims priority, application Japan, Jun. 25, 1982, 57-109338
Int. Cl.[4] H03L *7/06*
U.S. Cl. 331—4 **8 Claims**



1. A pull-in control apparatus for phase locked loop circuits in which the input signal includes a spurious component in addition to a true frequency component to be locked, comprising:

scanning means for generating a scanning control voltage in response to a scanning restart pulse;

a voltage controlled oscillator in said phase locked loop circuit, a control input thereof receiving said scanning control voltage;

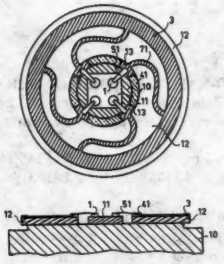
lock detecting means for detecting the fact that said phase locked loop circuit has locked to said true frequency component, and for generating a lock detection signal;

scanning restart means for periodically applying said scanning restart pulse to said scanning means when said lock detection signal is not generated within a preselected period of time and for stopping the application of said scanning restart pulse to said phase locked loop circuit in response to the generation of said lock detection signal.

4,617,528
COMPACT COMBINER FOR USE WITH SEMICONDUCTOR DEVICES IN THE MICROWAVE FREQUENCY RANGE

Alain Bert, Gif sur Yvette, and Narguise Mamodaly, Paris, both of France, assignors to Thomson CSF, Paris, France

Filed Sep. 27, 1983, Ser. No. 536,393
Claims priority, application France, Sep. 28, 1982, 82 16296
Int. Cl.[4] H01B *1/00;* **H01P** *5/12*
U.S. Cl. 331—56 **14 Claims**



11. A compact combiner, comprising:

a metallic support member;

an annular dielectric substrate with a hole in the middle, mounted on said support member;

a plurality of semiconductor devices mounted within said hole;

a ring-shaped metallic output element mounted on the periphery of said dielectric substrate; and

a plurality of curvelinear-microstrip lines mounted on said dielectric substrate, each said microstrip line having a length and a width and a first end which is coupled to a respective one of said semiconductor devices and a second end which is coupled to said output element,

wherein said dielectric substrate has a dielectric constant ϵ which is selected so as to reduce the length of each said microstrip line.

4,617,529

RING OSCILLATOR WITH DELAY ELEMENT AND POTENTIAL PULLING CIRCUIT

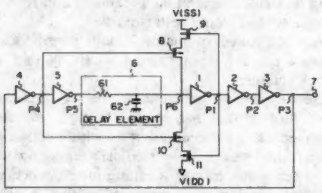
Atsushi Suzuki, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 16, 1985, Ser. No. 766,308

Claims priority, application Japan, Aug. 23, 1984, 59-175390

Int. Cl.[4] H03B *5/00*; H03L *1/02*

U.S. Cl. 331—57 **8 Claims**



1. An oscillator circuit comprising:

an odd number of inverters connected in cascade to form a loop;

a delay element inserted between adjacent inverters; and

a pulling circuit for pulling up the potential of the output terminal of said delay element during a predetermined period after the potential of said output terminal becomes higher than the threshold voltage of said inverter connected to the output terminal of said delay element and/or for pulling down the potential of said output terminal during a predetermined period after the potential of said output terminal becomes lower than said threshold voltage.

4,617,530

PSEUDO-RANDOM NOISE GENERATOR

James R. Young, Palo Alto, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 17, 1985, Ser. No. 745,155

Int. Cl.[4] H03B *29/00*; G08B *3/00*

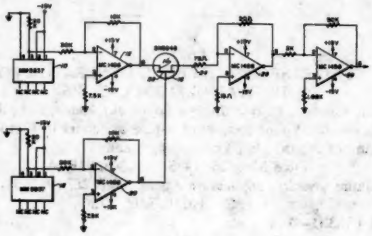
U.S. Cl. 331—78 **8 Claims**

1. An improved psuedo-random noise generator comprising:

a first random pulse generator for generating random pulses that are repeated at a first time interval,

a second random pulse genrator for generating random pulses that are repeated at a time interval that is different from said first time interval, and

circuit means coupled to said first and second pulse generators for ANDing the outputs of said pulse generators to



produce a noise signal having a long repetition period that repeats at least every minute.

4,617,531

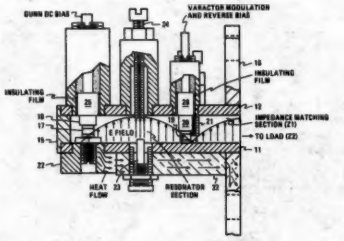
DIRECTLY MODULATED MICROWAVE OSCILLATOR HAVING ADJUSTABLE LOAD COUPLING

Daniel P. Bowlds, Hawesville, and Edward B. Foster, Owensboro, both of Ky., assignors to General Electric Company, Syracuse, N.Y.

Filed Sep. 13, 1985, Ser. No. 775,926

Int. Cl.[4] H03B *5/08*

U.S. Cl. 331—96 **5 Claims**



1. A microwave source comprising

A. a rectangular waveguide with a shorting wall at one end, the side walls, floor, and ceiling extending toward an opening at the other end thereof at a first characteristic impedance Z_1,

said waveguide being effectively divided into a resonator section extending from said one end for an electrical length of 180 degrees, and an adjustable load matching section extending from said resonator section to said opening at said other end, said matching section having an electrical length variable through 90 degrees for adjustably coupling energy from said resonator section via said opening to a waveguide load having a second characteristic impedance Z_2, differing from Z_1,

B. a negative resistance device and a first coupling post connected in series between said floor and ceiling of said resonator section, positioned near said shorted end to complete an H field coupling loop to sustain oscillations within said resonator section,

C. a varactor diode and a second coupling post connected in series between the floor and ceiling of said waveguide, and a third post, adjustably extending between the floor and ceiling of said waveguide at a position more remote than said second post from said end wall for forming a low impedance between the ceiling and floor of said waveguide which defines the boundary between said resonator section and said matching section,

said series connected varactor diode and second post and

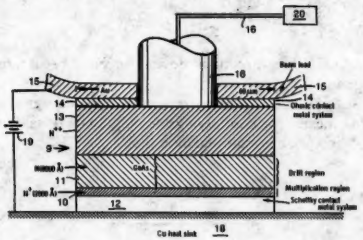
said third post being spaced to provide an H field coupling loop near the outer boundary of said resonator section for achieving varactor tuning sensitivity,

the adjustment of said third post controlling the electrical length of said impedance matching section and thereby providing said adjustable coupling.

4,617,532
OPTICALLY STABILIZED SEMICONDUCTOR MICROWAVE DIODES

Wenpeng Chen, Silver Spring, and Norman E. Byer, Columbia, both of Md., assignors to Martin Marietta Corporation, Bethesda, Md.

Filed Apr. 30, 1984, Ser. No. 605,723
Int. Cl.⁴ H01L *31/00*
U.S. Cl. 331—107 R **3 Claims**



1. A system providing an optically phase-locked semiconductor device comprising:

(a) a plurality of layers of the same semiconductor material, including an active and a non-active region, doped with different concentrations of impurities and wherein said active region comprises a layer or layers doped with lower concentrations of impurities than said non-active region;

(b) means to generate modulated light having an energy level below the absorption edge of said non-active region but above the absorption edge of said active region; and

(c) means to couple said light to a face of a layer of said non-active region.

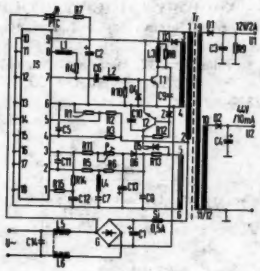
4,617,533
CIRCUIT ARRANGEMENT FOR A BLOCKING OSCILLATOR SWITCHING POWER UNIT

Ernst Paulik, Hilgertshausen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 14, 1985, Ser. No. 701,391
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1984, 3405833
Int. Cl.⁴ H03K *3/16*
U.S. Cl. 331—113 A **4 Claims**

1. In a circuit arrangement for a blocking oscillator switching power unit of the type in which a transformer includes at least three windings on its primary side and at least one winding on its secondary side, in which a switching transistor circuit is operated to periodically apply a rectified and smooth input voltage to a first of the primary side windings, in which a drive circuit is connected to and operates to drive the switching transistor circuit and receives a rectified and smoothed supply voltage via a second winding at the primary side during the blocking phase and receives a test voltage from one end of a third winding at the primary side during the flow phase, whereby the drive circuit can register the zero-axis crossings of the test voltage, and in which the drive circuit includes a supply input connected to one end of the second winding via a diode and to an a.c. voltage input of an input voltage rectifier via a resistor, the improvement comprising:

a further diode connected to one end of the third winding, and a further switching transistor, said further switching transistor including a controlled-conduction path connected between said further diode and the supply input of the drive circuit, and a base, and a Zener diode connecting

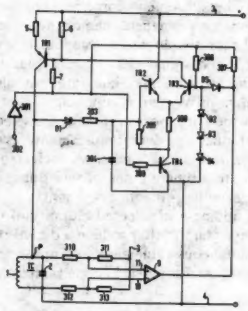


said base to the other end of the second winding and operable during a start-up time to switch the output of the voltage rectifier to the supply input of the drive circuit until said Zener diode causes said further switching transistor to switch off.

4,617,534
HIGH-SPEED SWITCHED OSCILLATOR

Graham D. Lill, Engadine, Australia, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 15, 1985, Ser. No. 712,576
Claims priority, application Australia, Mar. 23, 1984, PG4217
Int. Cl.⁴ H03L *5/00*
U.S. Cl. 331—117 R **15 Claims**



1. An oscillator comprising;

a supply source of substantially constant current including a control element by which the current magnitude may be controlled, a tuned resonant circuit, switching means for changing the operating mode of the oscillator from a standby mode to an oscillatory mode and vice versa by switching the control element from one operating condition to another so that, during the standby mode, a charging current is supplied from the current source to an inductance of the resonant circuit, and upon transition from the standby mode to the oscillatory mode the charging current supply is interrupted, a control loop coupled between the resonant circuit and the control element for supplying a control voltage to the control element which is dependent upon the voltage across the resonant circuit whereby, during the oscillatory mode, a pulse of current is supplied from the current source to the resonant circuit on

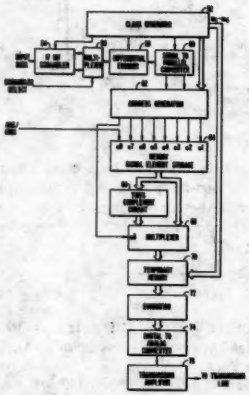
alternate half-cycles of an oscillatory voltage developed across the resonant circuit.

4,617,535

PSK DIGITAL ECHO MODULATOR WITH REDUCED MEMORY CAPACITY REQUIRED

M. Tarik Unerdem, Sunnyvale, Calif., assignor to Exar Corporation, Sunnyvale, Calif.

Filed Jun. 12, 1985, Ser. No. 744,168
Int. Cl.⁴ H03C *3/00*
U.S. Cl. 332—16 R **16 Claims**



1. In a modulator for producing a composite transmission signal corresponding to a plurality of overlapping signal elements, each signal element corresponding to an element of data, and having a permanent memory for storing a multiplicity of digital representations of instantaneous values of amplitudes of each said signal element at a plurality of positions corresponding to sampling time intervals along said signal elements, the improvement comprising;

temporary memory means for storing a selected plurality of said multiplicity of digital representations of instantaneous signal element values, each of said selected plurality corresponding to a separate one of said signal elements during a single sampling time interval; and

means for adding said selected plurality of values from said temporary memory to produce a digital representation of the instantaneous value of said composite signal in a single add operation during said single sampling time interval.

4,617,536

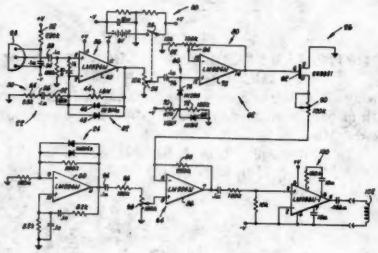
AMPLITUDE MODULATION APPARATUS AND METHOD

Gordon L. Richard, Minco, Okla., assignor to Baptist Medical Center of Oklahoma, Inc., Oklahoma City, Okla.

Division of Ser. No. 444,460, Nov. 24, 1982, Pat. No. 4,499,339. This application Jun. 15, 1984, Ser. No. 621,181
Int. Cl.⁴ H03C *1/08;* H04R *25/00*
U.S. Cl. 332—37 D **15 Claims**

1. In an amplitude modulation apparatus of the type wherein a modulating signal having a peak-to-peak value is used for modulating a carrier signal having a quiescent peak-to-peak value, the improvement comprising modulation means for providing a modulated signal having peak-to-peak values within a range, and only within said range, between a value substantially equal to said quiescent peak-to-peak value and a value which is a multiple of said quiescent peak-to-peak value, said multiple being determined by said modulating signal peak-to-peak value, said modulating signal having magnitude excursions in two directions between upper peak values and lower peak values; and said modulation means including:

signal conditioning means for shifting said modulating signal by a variable amount so that said magnitude excursions in



one of said two directions never exceed a predetermined value; and

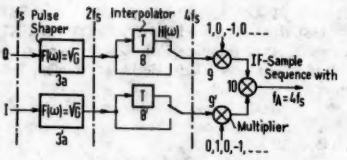
carrier signal modulator means, responsive to said signal conditioning means, for multiplying the magnitude of said carrier signal by variable multiplication factors.

4,617,537

METHOD FOR DIGITAL QUADRATURE AMPLITUDE MODULATION

Josef A. Nossek, Iffeldorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 30, 1984, Ser. No. 595,527
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1983, 3314603
Int. Cl.⁴ H03C *1/00;* H03D *1/00*
U.S. Cl. 332—48 **1 Claim**



1. A method for clocked digital amplitude modulation, wherein signal sampling sequences are available from two carrier oscillations which are at 90° phase positions relative to one another and at a predetermined sampling frequency, comprising the steps of:

producing the carrier oscillations at one-fourth of the predetermined sampling frequency;

setting the phase positions relative to the sampling times such that every second sample of both carrier oscillations is alternately zero so that respectively one of the two carrier oscillations is zero at every clock time;

reversing the operational sign of every second sample to provide two sampling sequences at half the sampling frequency; and

interleaving the two sampling sequences to provide quadrature amplitude modulation offset by one sampling.

4,617,538

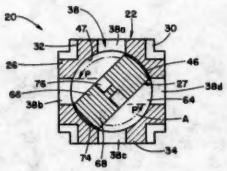
MICROWAVE WAVEGUIDE SWITCH ASSEMBLY

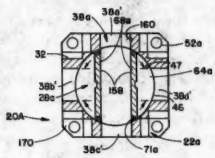
Victor H. Nelson, 10 Redwood Dr., Dix Hills, N.Y. 11746

Continuation-in-part of Ser. No. 464,689, Feb. 7, 1983. This application Jun. 21, 1984, Ser. No. 623,151

Int. Cl.[4] H01P 1/10, 5/12

U.S. Cl. 333—106 4 Claims





1. A microwave waveguide switch assembly operable in at least two positions, comprising:

a hollow housing having a cylindrical hollow chamber therein;

a rotor axially rotatable in said chamber;

said housing having four sides disposed at right angles to each other, with a rectangular opening in each of said sides communicating with said chamber for passing microwaves therethrough;

each of said openings having the same length and width and each of said openings being equally spaced circumferentially of said chamber;

said rotor having a pair of axially spaced cylindrical end plates integrally formed with a wall means thereinbetween extending axially of said chamber, said end plates extending perpendicular to the axis of rotation of said rotor to open two separate passages for passing microwaves through said housing between adjacent pairs of said openings, each of said separate passages being formed by said cylindrical end plates and said wall means of said rotor and by said walls of said chamber when said rotor is disposed in one of two positions, and two other separate passages for passing microwaves through said housing between two other adjacent pairs of said openings each of said other separate passages being formed by said cylindrical end plates and said wall means of said rotor and said walls of said chamber when said rotor is disposed in the other one of said two positions; the diameters of said end plates and width of said wall means being substantially equal to the diameter of said chamber to prevent leakage of microwaves out of said chamber beyond said end plates axially of said housing and rotor, and to prevent leakage of microwaves between said passages in said housing in each of said positions of said rotor, and to provide a rotor path presenting less discontinuities to the propagation of microwaves.

4,617,539

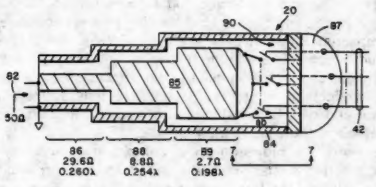
REFLECTIVE PHASE SHIFTER

Richard L. O'Shea, Holliston, Mass., and Philip R. Merrill, Nashua, N.H., assignors to Raytheon Company, Lexington, Mass.

Filed May 13, 1985, Ser. No. 733,350

Int. Cl.[4] H01P 1/185

U.S. Cl. 333—164 14 Claims



1. A phase shifter wherein radio frequency energy is fed into an input/output port of such phase shifter and then coupled from such phase shifter at the input/output port, such phase shifter providing one of a plurality of predetermined phase shift between the fed energy and the coupled energy selectively in accordance with a control signal, such phase shifter comprising:

a coaxial transmission line having a uniform inner conductor and an outer conductor, a first end of the uniform inner conductor and a first end of the outer conductor providing the input/output port of the phase shifter;

a conductor connected to the second end of the outer conductor, such conductor being dielectrically spaced from a second end of the uniform inner conductor; and

a plurality of switch means, disposed between different portions of the second end of the uniform inner conductor and the conductor in response to a control signal, for electrically connecting a selected one or ones of said different portions of the second end of the uniform inner conductor directly to the conductor while unselected ones of said different portions of the second end of the uniform inner conductor remain dielectrically spaced from said conductor.

4,617,540

AUTOMATIC SWITCH, RAIL-MOUNTED

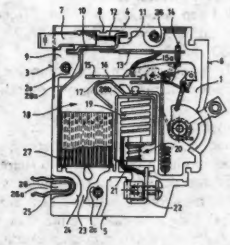
Joseph Westermeyer, Nuremberg, Fed. Rep. of Germany, assignor to Sursum Elektrizitatsgesellschaft Leyhausen GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Oct. 23, 1984, Ser. No. 664,010

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1983, 3339401

Int. Cl.[4] H01H 75/12, 73/48

U.S. Cl. 335—35 5 Claims



1. An automatic switch for mounting on rails, comprising:

a hand lever disposed on the front side of a housing and a rail-mounting device on the rear side;

said rail-mounting device comprising a two-armed plug contact disposed on the upper transverse side and a second holding organ, also two-armed, which is attachable by clip or catch means and is disposed on the lower transverse side at a distance from said plug contact;

wherewith the lower housing part forms an arc chamber which accomodates deionization plates near the lower transverse side and accommodates a switch contact above said plates, and the forward housing part accomodates an impact-armature trigger near the lower transverse side, and accomodates a switch mechanism and a bimetallic trigger above said impact-armature trigger, wherewith said bimetallic trigger is affixed to a metallic support strip, one end of which extends into a recess in a thickened region of the wall of the rear side;

wherewith the plug contact is comprised of an electrical connection to the bimetallic trigger, and a screw clamp provided on the lower transverse side forms an electrical connection to the impact-armature trigger;

wherewith the switch contact is formed by a stationary contact element electrically connected to the impact-armature trigger, along with a movable contact element associated with the switch mechanism and electrically connected to the bimetallic trigger, wherewith the switch mechanism is comprised of a pivotably mounted switch arm which pivotably bears the movable contact element and also pivotably bears a pawl, one end of said pawl detaining a blocking lever when the switch contact is in the closed position and the other end of said pawl being pivotably connected to an intermediate pivoted connecting piece the other end of which intermediate piece is pivotably connected to the inner end of the hand lever;

wherewith the lever holding organ is disposed at the altitude of the screw clamp and surrounds an elongated appendage of the housing, wherewith an eye including a hole for insertion of a bolt or other shaft-like fastener therebetween is disposed between the lower holding organ and the screw clamp;

wherewith the opposite end of the support strip of the bimetallic trigger engages in a recess in continuation of the side wall of the upper side and is connected to the plug contact by means of a stranded wire;

and wherewith, when the switch contact is in the closed position, the grip member of the hand lever is oriented upward, in a direction toward the upper transverse side, the location of engagement of the intermediate pivoted connected piece with the hand lever is disposed on the side of the axle, which side is farther from the front side, and the detaining end of the pawl is closer to said front side than the articulation end of said pawl.

4,617,541

ELECTROMAGNETIC STARTER FOR REVERSIBLE MOTOR

Chiu-Hsiung Chuang, Taipei, Taiwan, assignor to Pen-Ho Huang, Taipei, Taiwan and Gordon Kuo-Chon Chang, New York, N.Y., a part interest to each

Filed Sep. 16, 1985, Ser. No. 776,640
Int. Cl.[4] H01H *63/02, 67/02*
U.S. Cl. 335—133 **5 Claims**

1. A starter for a reversible motor comprising:

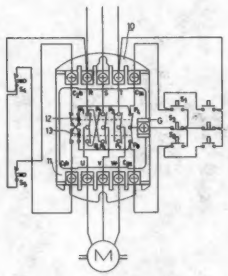
an outer casing for the installation of a plurality of operating members;

a movable member having numerous sets of movable contacts attached on one surface thereof;

a fixed member having a cavity formed therein for securing a plurality of sets of fixed electric contacts corresponding to said sets of movable contacts of said movable member;

means for positioning said movable member with respect to said fixed member so that corresponding contacts are normally in an open position and also act as a fulcrum of the movement of the movable member, said positioning means comprising a plurality of pins protruding from one surface of the movable member and corresponding pins being located in said fixed member and bias springs being sleeved onto and between said pins;

a plurality of flexible conduction plates connected to said fixed contacts in said fixed member to form an appropriate power feeding circuitry; and



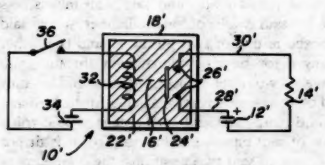
a pair of electromagnets each having at least a movable iron core portion which is linked to one end of said movable member, thereby when one of the electromagnets is actuated, one of said sets of movable contacts and fixed contacts arranged to come in contact, correspondingly closing one of a forward rotation and reverse rotation circuit for a reversible motor.

4,617,542

HIGH VOLTAGE SWITCHING DEVICE

Erno B. Lutz, Sunnyvale; Bruce A. Weber, San Jose, and Jerry Markle, Mountain View, all of Calif., assignors to IMCS Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 542,583, Oct. 17, 1983. This application Aug. 2, 1984, Ser. No. 637,030
Int. Cl.[4] H01H *1/00*
U.S. Cl. 335—196 **10 Claims**



1. A method of improving the switching performance of a pair of switch contacts, the method comprising in combination the steps of at least partially enclosing the pair of contacts and filling the enclosure at least to the point where the pair of contacts are immersed in a solution at least a portion of which comprises: a totally fluorinated hydrocarbon having an average molecular weight of 650.

4,617,543

COIL BOBBIN

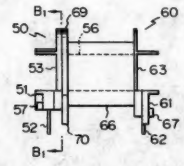
Yoshiaki Akachi; Yasuo Kyoso, and Takeo Matsumaru, all of Chiba, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Jan. 24, 1985, Ser. No. 694,427

Claims priority, application Japan, Jan. 26, 1984, 59-10025[U]; Jan. 26, 1984, 59-10026[U]; Feb. 28, 1984, 59-28614[U]

Int. Cl.[4] H01F *15/10, 27/30*

U.S. Cl. 336—192 1 Claim



1. A coil bobbin comprising

an outer bobbin having a first hollow member having a first flange located around one end thereof, said first flange having a first terminal plate with a plurality of first terminal pins and first grooves for accommodating lead wires, said first member having a second flange located around the other end thereof, and

an inner bobbin having a second hollow member having a third flange located around one end thereof, said third flange having a second terminal plate with a plurality of second terminal pins and second grooves for accommodating lead wires, said coil bobbin beng assembled by inserting said second hollow member into said first hollow member so that said first and second terminal plates are parallel with each other characterized in that

said second flange has a cover portion having an outside face that butts with an inside face of said second terminal plate and covers opening ends of said second grooves on said inside face, said cover portion extending beyond said second terminal plate, the bottom surface of said cover portion being flat and forming a continuous bottom surface so that said bottom surface butts uniformly on a surface of a printed circuit board when the assembled coil bobbin is mounted on said printed circuit board, wherein said cover portion elongates the creeping distance between a coil on said outer bobbin and said lead wires extended from a coil on said inner bobbin to said second terminal pins and said cover supports said assembled coil bobbin.

4,617,544

HIGH VOLTAGE, HIGH RUPTURE CAPACITY FUSE

Dietrich Mooz, Krefeld, and Rolf Dirks, Willich, both of Fed. Rep. of Germany, assignors to Felten & Guilleaume Energietechnik GmbH, Cologne, Fed. Rep. of Germany

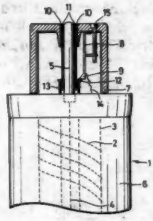
Filed Mar. 18, 1985, Ser. No. 713,273

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1984, 3409957

Int. Cl.[4] H01H *37/00, 85/00, 71/20*

U.S. Cl. 337—3 7 Claims

1. A high voltage, high rupture capacity fuse comprising a main fusible conductor for interrupting a short-circuit current in an outer circuit, an auxiliary fusible conductor for releasing a spring biased impact pin, an insulating body surrounding the two fusible conductors and being hermetically closed at two opposite sides thereof by conductive caps, the caps acting as contact terminals for the two fusible conductors, at least one cap having an outlet opening opposite said impact pin, a tripping sleeve arranged in said outlet opening and surrounding said impact pin to guide the same through said outlet opening, a bimetal release arranged in said one cap and being electrically connected to said fusible conductors, said bimetal release including a pawl normally engaging said sleeve, and spring means biasing said tripping sleeve against said pawl so as to



eject said tripping sleeve through said outlet opening against a load interrupter when an overcurrent activates said bimetal release and said pawl disengages said sleeve.

4,617,545

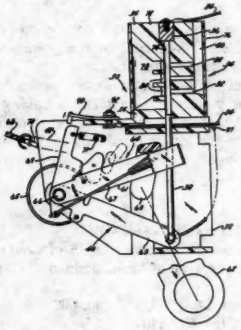
SUBMERSIBLE PRIMARY CIRCUIT BREAKER

Edwin A. Link, Waukesha, Wis., assignor to RTE Corporation, Waukesha, Wis.

Division of Ser. No. 412,602, Aug. 30, 1982, Pat. No. 4,521,823. This application Mar. 20, 1985, Ser. No. 699,734

Int. Cl.[4] H01H *71/16*

U.S. Cl. 337—74 4 Claims

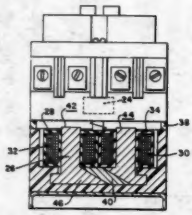


1. In a transformer primary circuit breaker comprising a frame, a current interruption assembly mounted on said frame and including a fixed contact and a second rod contact moveable through said interruption assembly into engagement with said fixed contact, said current interruption assembly comprising a housing including a core of arc quenching material having a bore therein, a sleeve enclosing said core to define a pressure chamber and an exhaust passage therein, said core including a number of openings transverse to said bore connecting said pressure chamber to said exhaust passage to provide a cross blast flow of arc quenching fluids from said pressure chamber across said bore to said exhaust passage, said fixed contact being located at one end of said bore and said rod contact being moveable through said bore into engagement with said fixed contact, a trip-free mechanism for moving said rod contact through said current interruption assembly into engagement with said fixed contact and a latch means operably connected to said trip-free mechanism to hold said rod contact in contact with said fixed contact, said latch means including a trip mechanism responsive to predetermined electrical or thermal conditions to release said latch mechanism and open said circuit breaker, whereby the arc in the bore will be extinguished by the flow of arc quenching fluid across the bore.

4,617,546
ELECTRICAL CONTROL APPARATUS WITH ELECTROMAGNETIC LATCH

Walter J. Kellogg, Black Mountain; Birch L. DeVault, Arden, and Kenneth L. Paape, Asheville, all of N.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 5, 1984, Ser. No. 657,924
Int. Cl.[4] H01H 9/20
U.S. Cl. 337—170 3 Claims

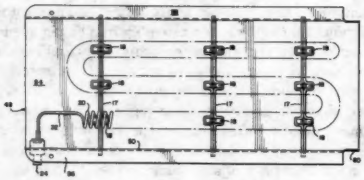


1. An electric control apparatus comprising:
(a) an insulating housing;
(b) pairs of separable contacts within the housing;
(c) means within the housing for moving the contacts between open and closed positions and comprising an electromagnetic control mechanism including a magnetic armature, a U-shaped core, and a coil;
(d) the magnetic U-shaped core including spaced legs and a yoke;
(e) a permanent magnet within the yoke extending across and through the cross-section of the yoke and having corresponding abutting interfaces;
(f) the magnet being inclined at an acute angle to the longitudinal axis of the yoke and the interfaces having a greater area than the cross-sectional area of a plane extending perpendicular to the longitudinal axis of the yoke; and
(g) the magnet consisting of a ceramic base material.

4,617,547
HEATER ASSEMBLY

H. Keith Howard; Jimmy L. Sherrill, both of Cookeville, and Robert L. Kirby, Sparta, all of Tenn., assignors to Tutco, Inc., Cookeville, Tenn.

Filed Apr. 20, 1984, Ser. No. 602,434
Int. Cl.[4] H01C 1/01
U.S. Cl. 338—317 17 Claims

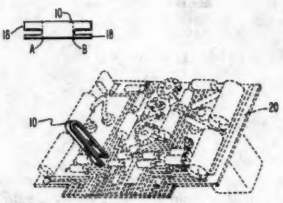


1. A heater assembly comprising a housing for channeling air flow and having opposed sidewalls,
a helically coiled heater element,
insulator means for engaging said heater element at a plurality of spaced locations,
a plurality of holding means for holding a plurality of said insulator means, each of said holding means having opposed ends, each of said ends is engaged with a respective one of said opposed sidewalls, wherein said sidewalls comprise means to receive said ends of said holding means, said plurality of holding means being spaced along said housing whereby said heater element, said insulators, and said holding means are supported only by said housing.

4,617,548
CURRENT SENSING RESISTANCE APPARATUS

Paul K. Buchwald, Jr., Margate, Fla., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jan. 7, 1985, Ser. No. 689,219
Int. Cl.[4] H01C 1/14
U.S. Cl. 338—325 1 Claim

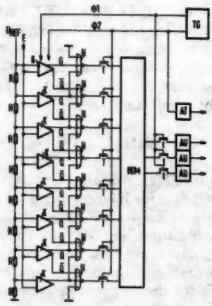


1. Current sensing resistance apparatus comprising:
a thin conductive ribbon having a length greater than its width and comprises of resistance grade conductive material,
said ribbon terminating at each opposite end in a longitudinal bifurcation forming individual pairs of input-output terminals respectively, wherein one terminal of each pair of terminals being disproportinately larger than the other terminal of each pair, and
said ribbon being formed into parallel portions effective to permit said terminals to be interconnected into associated operative electrical circuitry with which the device is utilized.

4,617,549
MONOLITHICALLY INTEGRABLE MOS-COMPARATOR CIRCUIT

Robert Reiner, Lynn East, South Africa, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Division of Ser. No. 396,142, Jul. 7, 1982, Pat. No. 4,532,438.
This application Jun. 17, 1985, Ser. No. 745,693
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1981, 3130391
Int. Cl.[4] H03M 1/36
U.S. Cl. 340—347 AD 3 Claims



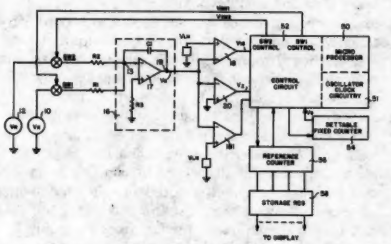
1. Integrated semiconductor circuit for an analog-to-digital converter according to the parallel method, comprising a multiplicity of identical comparators, each of said comparators

having a reference input, a signal input, first and second signal outputs, and means for transmitting a first clock signal controlling said first signal output and for transmitting a second clock signal controlling said second signal output, a multiplicity of NOR gates respectively having first, second and third inputs and an output, said comparators being addressable in a staggered manner at the reference inputs thereof by a respective reference voltage and at the signal inputs thereof jointly by a signal to be evaluated, each of said comparators, respectively, being connected by the respective first signal output thereof to said first input of a respective one of said NOR gates forming with the respective comparator, a weighting stage, said respective comparator being further connected by said respective first signal output thereof to the second input of another of said NOR gates associated with another of said comparators addressable by a next higher reference voltage, the respective comparator being also connected by the respective second signal output thereof to the third input of a further one of said NOR gates associated with yet another of said comparators addressable by a next lower reference voltage, a read-only memory having a multiplicity of inputs, the respective outputs of said NOR gates being connected via respective transfer transistors to said inputs, respectively, of said read-only memory, said transfer transistors in totality being connected to said signal transmitting means and being controlled by said first clock signal serving for controlling said first signal outputs of said comparators.

4,617,550
ANALOG-TO-DIGITAL CONVERTERS WITH VIRTUAL INTEGRATION

Mandel Glincman, Hillsborough Township, Somerset County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed May 24, 1984, Ser. No. 613,415
Int. Cl.[4] H03M *1/06*
U.S. Cl. 340—347 AD **10 Claims**



1. The combination comprising:

an integrator having an input, an output, and first and second power terminals for the application thereto of first and second voltages, respectively, the voltage at the output of said integrator being capable of swinging, at most, between said first and second voltages;

a first input terminal for the application thereto of an input signal;

a second input terminal for the application thereto of a reference voltage;

a first resistor connected between said integrator input and a first node;

a second resistor connected between said integrator input and a second node; and

controllable means coupled between said first and second input terminals and said first and second nodes for:

(a) selectively applying an input signal of unknown amplitude to the input of said integrator for a sampling interval of fixed duration (T_S), said input signal capable of producing a voltage at the output of said integrator which increases during said interval T_S from a threshold level to a value which could exceed one of said first and second voltages; and

(b) selectively applying a reference potential of known amplitude and of a polarity opposite to that of said input signal to said integrator input; said controllable means coupling said input signal via said first resistor for one time period, which is approximately one-half of T_S, and via said second resistor for another time period, which is approximately one-half of T_S; and said controllable means coupling said reference potential via that one of said first and second resistors not being used to couple said input signal;

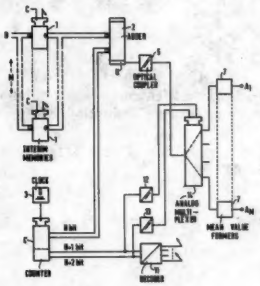
means responsive to the amplitude of the voltage at the output of said integrator, for sensing when the voltage at said output reaches a predetermined limit during said sampling interval T_S and then enabling said controllable means for causing the application of said reference potential, simultaneously with the application of said input signal, until said output voltage decreases below said predetermined limit; and

means for enabling said controllable means following the termination of said sampling interval, for applying said reference potential, until the output of said integrator is restored to said threshold level.

4,617,551
DIGITAL-TO-ANALOG CONVERTER WITH POTENTIAL SEPARATION

Paul A. Ophoff, Worth, Fed. Rep. of Germany, assignor to Siemens Aktiengeselischaft, Munich, Fed. Rep. of Germany

Filed Sep. 23, 1983, Ser. No. 535,073
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1982, 3235741
Int. Cl.[4] H03K *13/02*
U.S. Cl. 340—347 DA **2 Claims**



2. A digital-to-analog converter for converting digital data on M data channels, comprising:

(a) M interim memories with tri-state or open collector outputs each having parallel storage locations for N bits;

(b) a free-running counter with at least N+1 bit outputs;

(c) an N-bit full adder with a carry output, having as inputs the outputs of said memories and the first N bit outputs of said counter;

(d) a first optical coupler having its input coupled to the carry output of said full adder;

(e) a second optical coupler having as an input the (N+1)th bit output of said counter;

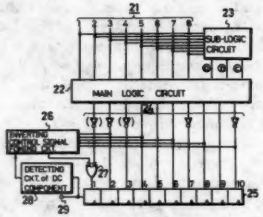
(f) an analog multiplexer having as a data signal input the output of said first optical coupler and as a control input the output of said second optical coupler;

(g) a plurality of M mean value formers coupled to the outputs of said multiplexer; and

(h) a decoder having as an input the output of said second

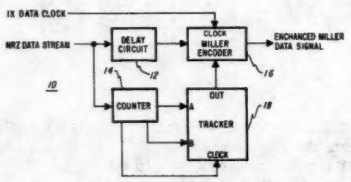
optical coupler and providing enable inputs to said memories.

4,617,552
METHOD AND APPARATUS FOR CONVERTING A DIGITAL DATA
Yuichi Kojima, and Shinichi Fukuda, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Aug. 27, 1984, Ser. No. 644,445
Claims priority, application Japan, Aug. 29, 1983, 58-157643
Int. Cl.[4] H03M *7/00*
U.S. Cl. 340—347 DD **8 Claims**



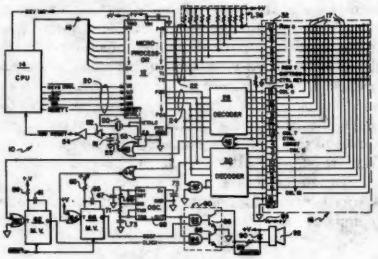
1. A method for converting digital data into an NRZI-coded digital signal, the method comprising steps of:
first detecting if the value of every even numbered bit of said digital data is digital zero;
second detecting if two bits of said detected even numbered bits having digital zero value and a preceding odd numbered bit have a DC component;
producing a detecting signal according to the result of said second detecting; and
converting said digital data into said NRZI-coded digital signal by using said detecting signal, thereby tending to minimize said DC component.

4,617,553
ENHANCED MILLER CODE
Mark A. Webster, and Richard D. Roberts, both of Palm Bay, Fla., assignors to Harris Corporation, Melbourne, Fla.
Filed Aug. 12, 1985, Ser. No. 764,681
Int. Cl.[4] H03M *5/14*
U.S. Cl. 340—347 DD **7 Claims**



1. A method for encoding digital data represented by a stream of data bits to produce an encoded signal, wherein the stream of data bits includes logical-one data bits and logical-zero data bits which are encoded as signal level transitions or the absence thereof in consecutive bit cells each associated with a respective one of the data bits in the stream of data bits, said method comprising the steps of:
(a) segregating the stream of data bits into a plurality of consecutive blocks, wherein the beginning of each block is delineated by a signal level transition from one type of data bit to the other
(b) determining the number of logical-one data bits in each block;
(c) determining the number of logical-zero data bits in each block;
(d) in response to steps (b) and (c), encoding each block so that there is substantially zero dc content in the encoded signal.

4,617,554
KEYBOARD SCANNING
Charles A. Krause, Stevensville, Mich., and Randy J. Vander Heyden, Garland, Tex., assignors to Zenith Electronics Corporation, Glenview, Ill.
Filed Aug. 26, 1983, Ser. No. 527,131
Int. Cl.[4] G11C *19/00*
U.S. Cl. 340—365 E **11 Claims**

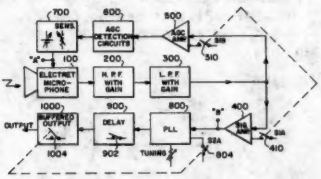


7. A system for detecting the simultaneous engagement of more than one key in a matrix-type keyboard having a plurality of selectively engageable keys representing a plurality of alphanumeric characters and operating modes, wherein said keyboard provides an output signal representing the selection of a given key, said system comprising:
signal generating means coupled to said keyboard for generating first and second pluralities of scan signals for sequentially scanning said keyboard;
signal processing means coupled to said keyboard for simultaneously receiving first and second output signals from said keyboard representing the selection of first and second alphanumeric character keys engaged at the same time, wherein said first key is selected first;
memory means coupled to said signal processing means and including first and second memory locations for storing said first and second output signals, wherein said first output signal is initially stored in said first memory location and is subsequently stored in said second memory location following the detection and storage of said second output signal in said first memory location;
key detection means coupled to said keyboard for detecting the deselection of said first or second keys;
means for detecting the engagement of an operating mode key following the engagement of said second key; and
data transfer means coupled to said key detection means and said memory means and responsive to the deselection of said first key for transferring said second output signal to said first memory location following the deselection of said first key, wherein a third output signal representing the engagement of a third alphanumeric character key generated in response to a third plurality of scan signals provided by said signal generating means to said keyboard is stored in said first memory location.

4,617,555
RECEIVER FOR AUDIBLE ALARM
Arthur E. Sheiman, Northvale, N.J., assignor to Data Distribution Devices, Inc., Closter, N.J.
Filed Apr. 17, 1985, Ser. No. 724,024
Int. Cl.[4] G08B *1/00*; G10K *11/00*
U.S. Cl. 340—531 **9 Claims**

1. Apparatus to detect sonic signals within a predetermined

range of frequencies comprising an electret microphone with integral FET impedance converter for receiving the sonic signal, band-pass filter means connected to the output of said electret microphone, AGC means connected to the output of



said filter means and producing an AGC bias voltage which is applied to the FET to control the sensitivity of said electret microphone, and means connected to the output of said filter means for producing a defined response to the presence of the sonic signal.

4,617,556

PHOTOSENSITIVE SOUND GENERATOR

Luis A. Rivera, and Patricia A. Rivera, both of 1278 Cambridge Ave., Plainfield, N.J. 07061

Filed Jul. 10, 1984, Ser. No. 629,452
Int. Cl.[4] G08B *13/08, 13/18*
U.S. Cl. 340—546 **7 Claims**

1. A self-contained photosensitive sound generator for use as an aid to behavior modification programs meeting the need to eliminate habitual and compulsive over-consumption of food stored in a darkened enclosure, such as a refrigerator or food storage container, comprising:

(a) a housing adapted to contain a photosensitive cell, a sound transducer and an energy source for said cell and transducer;

(b) a sound transducer in said housing;

(c) a photoelectric cell in electrical communication to said energy source responsive to light when said enclosure is opened for the purpose of taking food, said photoelectric cell immediately energizing said sound transducer when activated by light to thereby cause a low audible signal alerting the person opening the enclosure to light that the opening behavior is to be stopped;

(d) an energy source in said housing;

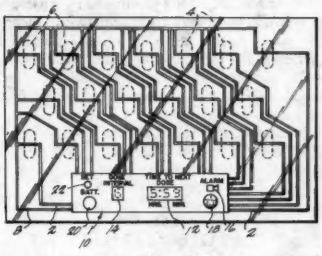
(e) moisture protecting means surrounding said housing to protect said cell, said sound transducer and said energy source from moisture and cold temperature; and an optical aperture in said housing located directly in front of said photosensitive cell which permits and directs the light entering the enclosure against said cell to energize the same.

4,617,557

MEDICATION COMPLIANCE AID FOR UNIT DOSE PACKAGING

Richard E. Gordon, Gales Ferry, Conn., assignor to National Patent Development Corporation, New York, N.Y.

Filed Nov. 8, 1984, Ser. No. 669,815
Int. Cl.[4] G08B *7/00;* **B65D** *83/04*
U.S. Cl. 340—568 **9 Claims**



1. A medication dispenser, comprising:

multi-compartment container means for housing an individual dose of medicine in each compartment, and for permitting random access to said compartments and dispensing of their contents;

timer means for timing a desired time period between dispensing of said doses of medicine, and generating a signal at the end of said desired time period;

alarm means for sounding an alarm in response to said signal from said timer means; and

scanning and memory means for scanning said compartments and recording whether said individual doses of medicine have been dispensed:

said dispenser further including setting means for setting said desired time period for said timer means, thereby establishing a dosage interval;

safety means to prevent unauthorized or accidental control of said setting means;

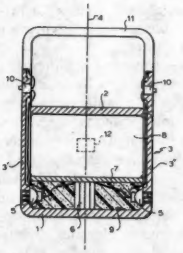
said safety means being engaged by the installation of a battery in said medication dispenser.

4,617,558

CONTAINER FOR SMALL CONSUMER ITEMS, SUCH AS HANDBAG, POUCH, PURSE, BOX OR THE LIKE, PROVIDED WITH ALARM

Abram Gin, 99-40 63 Rd., Rego Park, N.Y. 11374

Filed Dec. 19, 1983, Ser. No. 563,187
Int. Cl.[4] G08B *13/02*
U.S. Cl. 340—574 **5 Claims**



1. A container for small consumer items, such as a handbag, a pouch, a purse, a box or the like, comprising:

a body part forming a first compartment for accommodating

small consumer items, and a second compartment separated from said first compartment by a partition, said body part having two opposite sides and a holding handle extending from one of said sides to the other of said sides;

a sound generating device arranged in said second compartment and operative for generating an alarming sound;

an autonomous electric current source arranged in said second compartment and supplying electric current to said sound generating device for generating the alarming sound by the latter; and

switch means arranged to be actuated by a user so that when the user manually acts upon said switch means said electric current source is turned on and thereby said sound generating device generates the alarming sound, said switch means including two switching elements, each located on a respective one of said sides of said body so that when the user holds said holding handle with his or her one hand, the user can reach with his or her other hand a respective one of said switching elements regardless whether he or she is left-handed or right-handed.

4,617,559

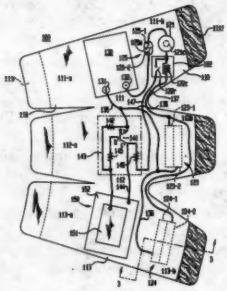
OPERATOR ALARM SYSTEM

Allan Slansky, 913 Charlotte Rd., Plainfield, N.J. 07060

Continuation-in-part of Ser. No. 379,439, May 18, 1982, abandoned. This application Aug. 31, 1984, Ser. No. 646,635

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—576 **12 Claims**



1. An alarm system for warning of reduced alertness on the part of an operator of a machine, the alarm system being of the type which is installed on a control member of the machine, the control member being displaceable over a substantially predeterminable displacement path in response to manipulation by the operator whereby the machine is controlled in response to the displacement, the alarm system having at least one electrode for receiving energy, the alarm system further comprising:

electrically actuatable alarm means for producing an alarm indication in response to receiving energy conducted thereto from the electrode;

first interruptor means having conductive and non-conductive states for controlling said conduction of said energy to said electrically actuatable alarm means;

a manipulatable element responsive to the operator for controlling said first interruptor means, whereby said conductive and non-conductive states of said first interruptor means are selectable in response to a manipulation condition of the operator, said manipulation condition being in response to the alertness of the operator; and

second interruptor means electrically interposed between the electrode and said electrically actuatable alarm means, said second interruptor means having conductive and non-conductive states which are selectable in response to the location of the control member along the predetermined displacement path for controlling conduction of said energy to said electrically actuatable alarm means in response to the displacement of the control member.

4,617,560

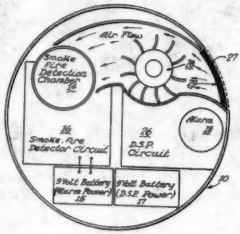
SMOKE OR FIRE DETECTOR

Robin P. E. Gutmann, 3051 Grant St., Hollywood, Fla. 33020

Filed Dec. 31, 1984, Ser. No. 688,007

Int. Cl.[4] G08B *17/10*

U.S. Cl. 340—628 **7 Claims**



1. A discriminative smoke or fire detector for preventing false alarms caused by transient smoke or fire in the ambient environment, said detector including a smoke or fire detector sensing system with a sensing means in a sensing chamber for producing a first signal indicative of a detected transient smoke or fire condition and an alarm signal means operably connected to said detector sensing system for providing an alarm signal, comprising:

an air moving means for conveying air through said chamber for purging transient smoke or fire in the ambient environment from said chamber;

an air moving control means connected to said air moving means for controlling operation of said air moving means;

switching control means for cyclically effecting operation of said air moving means and operation of said alarm signal means, said switching control means including a first means responsive to the presence of smoke or fire for providing a first signal for generating electric current to said air moving control means, and a second means for activating said air moving means for conveying air through said chamber for purging said chamber of said transient smoke or fire thereby requiring a second signal for generating an electric current for activating said alarm signal means, said switching control means responsive to the presence of additional smoke or fire in said purged chamber for generating an electric current for providing a second signal for activating said alarm signal means.

4,617,561

EMERGENCY LIGHT AND SMOKE ALARM SYSTEM

Kenneth A. Brown, West Simsbury, Conn., assignor to Second Chance Systems, Inc., North Haven, Conn.

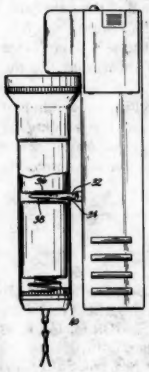
Filed Mar. 11, 1985, Ser. No. 710,554

Int. Cl.[4] G08B *17/10*

U.S. Cl. 340—628 **5 Claims**

1. A portable emergency light and smoke alarm system comprising a portable housing having a mounting bracket; a smoke detector mounted in said housing for sensing the presence of smoke; audible alarm means mounted in said housing and operably connected to said smoke detector for sounding an audible signal upon the sensing of smoke by said smoke detector; light means mounted in said housing and operably connected to said smoke detector for producing a visual signal upon the sensing of smoke by said smoke detector; DC power means mounted in said housing; circuit means connected to said smoke detector, said audible alarm means, said light means and said DC power means for activating said smoke detector, said audible alarm means and said light means by said DC

power means upon the sensing of smoke by said smoke detector; and a flashlight mounted on said bracket of said housing, said flashlight having a DC power source for activating said flashlight wherein said bracket includes means for deactivating



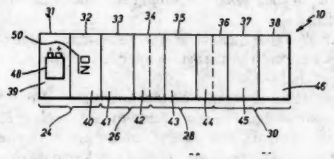
said DC power source of said flashlight so as to maintain said flashlight in the off position when said flashlight is mounted on said bracket and wherein said DC power source is activated automatically upon removal of said flashlight from said bracket so as to activate said flashlight.

4,617,562

MULTICOLORED LIQUID CRYSTAL DISPLAY

Dell E. Klotz, 10323 Kirkhill Dr., Houston, Tex. 77089

Filed Apr. 11, 1983, Ser. No. 483,729
Int. Cl.[4] G09G *3/20*
U.S. Cl. 340—753 **27 Claims**



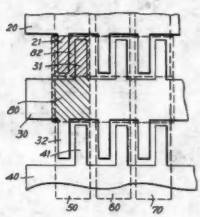
1. A display for an intensity level measuring device of the general type in which the intensity level is converted by an electronic circuit into a corresponding voltage level, the display comprising a multicolored liquid crystal display, the liquid crystal display comprising a plurality of shutters, each shutter defining a display window, at least some of the display windows when activated being of a different preselected color or colors from some other activated windows, each shutter being activatable by electronic circuitry responsive to a unique minimum voltage level generated by the electronic circuit, the preselected color or colors of each window remaining unchanged at a voltage level above its minimum unique voltage level whereby the display indicates an intensity level according to the colored display window corresponding to the activated shutter.

4,617,563

LIQUID CRYSTAL DISPLAY DEVICE

Hitoshi Fujiwara, and Yoshikiyo Futagawa, both of Shiojiri, Japan, assignors to Seiko Epson Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1983, Ser. No. 565,545
Claims priority, application Japan, Dec. 28, 1982, 57-234278
Int. Cl.[4] G09G *3/36*
U.S. Cl. 340—784 **22 Claims**



1. A liquid crystal display device comprising:
a first transparent substrate having thereon a plurality of first main electrodes and a plurality of first auxiliary electrodes each extending from one of said first main electrodes;
a second transparent substrate positioned in spaced relationship to the first transparent substrate and having thereon a plurality of second main electrodes in facing relation to said first main electrodes and said first auxiliary electrodes, so that the second main electrodes have mutually confronting portions with the first main electrodes defining main pixels therebetween, and with the first auxiliary electrodes defining auxiliary pixels therebetween;
a liquid crystal composition maintained between said first and second transparent substrates; and
driving means for applying driving signals to the first and second main electrodes;
whereby the application of driving signals to the first and second main electrodes and the presence of the liquid crystal composition between the first substrate and the second substrate in the regions of the main pixels and the auxiliary pixels allows an image display in the main pixel and auxiliary pixel regions.

4,617,564

GRAPHIC DISPLAY SYSTEM WITH DISPLAY LINE SCAN BASED OTHER THAN POWER OF 2 REFRESH MEMORY BASED ON POWER OF 2

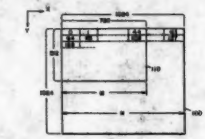
Yoshikazu Yoshioka, Kamakura, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

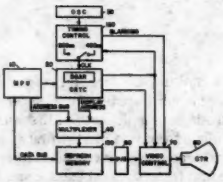
Filed Oct. 17, 1983, Ser. No. 542,327
Claims priority, application Japan, Feb. 24, 1983, 58-28635
Int. Cl.[4] G09G *1/02*
U.S. Cl. 340—798 **2 Claims**

1. A graphic display system for utilizing a raster line scanning display device having a number of line segments M in each line scan based on an integer selected exclusively from integers not generated by powers of 2 and normally requiring complex address calculations when sequentially accessing information from an associated refresh memory and further having a retrace time period at the end of each line scan, said system comprising:
a refresh memory having N memory blocks for each line scan of said display device wherein N is an integer greater than M, selected from integers generated by powers of 2, said memory blocks being assigned sequential addresses and each memory block storing video data for one of said line segments of said display device;
means for accessing M memory blocks from said refresh memory and supplying the information stored therein to said display device during a display time interval corre-

sponding to each line scan period of said display device and accessing (N−M) memory blocks during the remaining time of each line scan period not including the retrace time period; and

timing control means including clock means and counter means for accessing said memory blocks at a first clock frequency during the display time interval of each line scan and for detecting the completion of accessing of M





memory blocks during the display time interval of each line scan period of said display device and said timing control means being further responsive to said detection of the completion of accessing to initiate access of memory blocks at a second clock frequency that is substantially higher than said first clock frequency and to inhibit displaying of said display device while said (N−M) memory blocks are accessed during the remaining time of each line scan period.

4,617,565

METHOD AND DEVICE FOR DATA COMMUNICATION

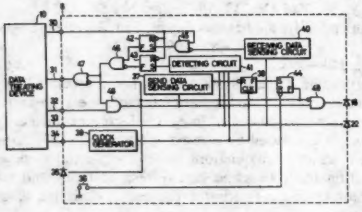
Yukio Nakata, Kawasaki; Kaoru Suda, Kitaadachi; Osamu Shiotsu, Asaka, and Motoyoshi Morito, Iruma, all of Japan, assignors to Yagi Antenna Co., Ltd. and Hitachi, Ltd., both of Tokyo, Japan

Filed Oct. 3, 1983, Ser. No. 538,509

Claims priority, application Japan, Oct. 8, 1982, 57-176298

Int. Cl.[4] H04Q *9/00*; H04B *9/00*

U.S. Cl. 340—825.5 **3 Claims**



1. A data communication method for use in a data communication system including a transmission line, and a plurality of stations each having a data device for treating data and a transceiver, whereby data communication is conducted through said transmission line between said stations under control of said stations,

wherein the improvement resides in that each transceiver executes the following steps;

(a) a first step of receiving a request-to-send signal from said data device;

(b) a second step of sending a clear-to-send signal to said data device in response to said request-to-send signal unless a data signal from any other station is being received by said transceiver;

(c) a third step of sending the data from said data device to said transmission line during the time said clear-to-send signal is being sent to said data device;

(d) a fourth step of measuring the duration of said data sending; and

(e) a fifth step of inhibiting the sending of said data over said transmission line and the sending of said clear-to-send signal to said data device simultaneously when the length of said data sending exceeds a predetermined time length.

4,617,566

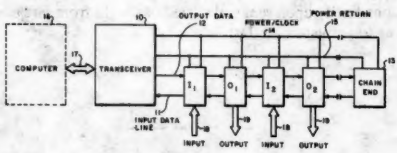
ADDRESSABLE-PORT, DAISY CHAIN TELEMETRY SYSTEM WITH SELF-TEST CAPABILITY

Anthony E. Diamond, San Diego, Calif., assignor to Teleplex Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 561,567, Dec. 15, 1983, This application Jun. 21, 1984, Ser. No. 622,984

Int. Cl.[4] G08C *15/00*

U.S. Cl. 340—870.11 **16 Claims**



1. A telemetry system for transferring pulsed input data signals in series from a daisy chain of input data ports to a receiver, said system comprising

a daisy chain of input data ports;

a clock signal generator for generating a pulsed clock signal having periodically alternating first and second states;

a clock line connected to the input data ports for carrying the clock signal pulses from the clock signal generator to the input data ports for timing the operation of the data ports;

a control signal generator for generating control signal pulses during the first-state intervals of the pulsed clock signal; and

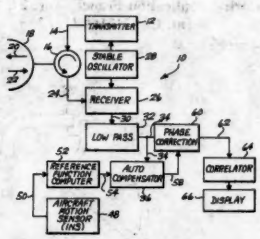
an input data line serially-connecting the input data ports to the control signal generator and to said receiver for carrying the control signal pulses from the control signal generator to the data ports and a serial block of data pulses from the respective input data ports to the receiver;

wherein each input data port includes a data register for registering an input data signal related to that input data port and for serially transferring the input data signal pulses related to that input data port from the data register onto the input data line during the second-state intervals of the pulsed clock signal, means for demultiplexing data signal pulses and control signal pulses received over the input data line from other input data ports and the control signal generator, and means for multiplexing all of the input data signal pulses and control signal pulses onto the input data line in their respective clock signal state intervals for transmission to the receiver and other input data ports connected in series between that input data port and the receiver.

4,617,567
AUTOMATIC MOTION COMPENSATION FOR RESIDUAL MOTION IN A SYNTHETIC APERTURE RADAR SYSTEM

Yuen-Kwok Chan, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 28, 1984, Ser. No. 656,143
Int. Cl.[4] G01S 13/90
U.S. Cl. 342—25 4 Claims



1. In a SAR system that receives reflections of radar signals from a target region, wherein such signals are combined with position signals from a motion sensor indicating antenna position, with the reflected signals and the position signals being integrated into range lines that may be combined to form a radar image, and wherein there may be residual motion between the antenna and the motion sensor, a method of correcting the position signals from the motion sensor to compensate for antenna residual motion that may cause phase corruption in the radar image, the method comprising:

a. transforming a received radar signal into a range line having a plurality of azimuth positions, and transforming said received signal into a frequency spectrum indicating the reflectivity of point reflectors at said azimuth positions, wherein one point reflector is located at each azimuth position, and wherein each point reflector is represented by a complex number having a certain magnitude and phase angle;

b. Sampling the range line for a symmetric triplet of three sequential point reflectors positioned at a distance from each other corresponding to a frequency, wherein said frequency corresponds to a mode of residual vibration of the antenna, and wherein said triplet includes a first point reflector, a second point reflector, and a third point reflector, all of which are represented by complex numbers, with said second point reflector being centrally positioned between said first and third point reflectors, and wherein such sampling includes calculating a first ratio of the complex number indicating reflectively of the first point reflector to the complex number indicating reflectivity of the second point reflector, and calculating a second ratio of the complex number indicating reflectivity of the third point reflector to the complex number indicating reflectivity of the second point reflector;

c. Comparing the difference between one of said ratios calculated in step (b) above, and the negative of the complex conjugate of the other of said ratios calculated in step (b), wherein if said difference is below a preselected threshold value, then said three point reflectors are considered to be a symmetric triplet;

d. Averaging the one of said ratios calculated in step (b) with the negative of the complex conjugate of the other of said ratios if said three point reflectors are considered to be a symmetric triplet;

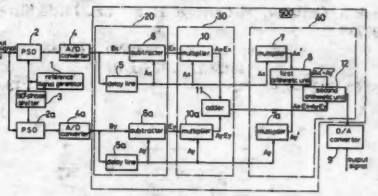
e. Calculating the amplitude and phase angle of the antenna residual motion from the averaged ratios in step (d) above, and generating an antenna residual motion signal therefrom; and

f. Combining the residual motion signal generated in step (e) above with the position signals from the motion sensor, to correct for antenna residual motion between the motion sensor and the antenna.

4,617,568
MTI RADAR

Norio Mutoh, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 13, 1984, Ser. No. 620,029
Claims priority, application Japan, Jun. 16, 1983, 58-109586
Int. Cl.[4] G01S 13/52
U.S. Cl. 342—160 5 Claims



1. An MTI radar provided with a MTI processor which comprises:

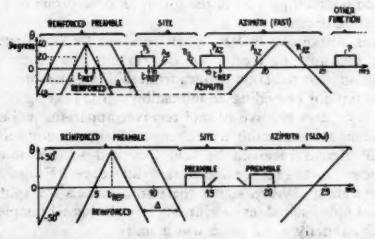
a single erasing means for erasing a vector signal received from a stationary target among a plurality of pre-erasing vector signals that include reflected waves received both from a moving and a stationary target producing a post-single erasing vector signal; and

arithmetic means for removing any other variations than variations from the moving target by calculating the inner product of the post-single-erasing vector signal and one of the pre-erasing vector signals.

4,617,569
PROCESS FOR INCREASING THE RANGE AND PARTICULARLY THE PROTECTION AGAINST JAMMING OF AN MLS LANDING SYSTEM AND MEANS FOR PERFORMING THIS PROCESS

Bruno Letoquart, Paris, France, assignor to Thomson-CSF, France

Filed Jun. 19, 1984, Ser. No. 622,341
Claims priority, application France, Jun. 21, 1983, 8310239
Int. Cl.[4] G01S 1/18
U.S. Cl. 342—412 15 Claims



1. A process for increasing the range of an MLS for assisting the landing of an aircraft, the process including a plurality of successive steps for transmitting an MLS function, the MLS function including information for assisting the aircraft to land, the process comprising:

transmitting at least once a supplementary reinforced preamble, the reinforced preamble having at least two outward scans and one return scan or at least one outward scan and two return scans;

identifying the time interval between two scans of the same type, the time interval being representative of identifica-

tion data for at least the first function following the reinforced preamble; and

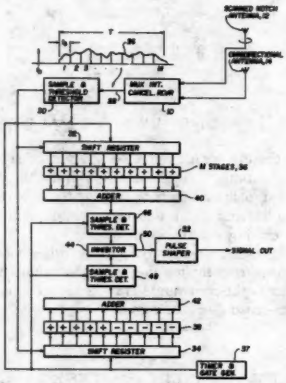
identifying the center instant of a scan sequence of the reinforced preamble, the scan sequence having an outward scan followed by a return scan, wherein the center instant is representative of the time reference data for at least the first function following the reinforced preamble.

4,617,570

INTERFERENCE CANCELLING RECEIVER HAVING HIGH ANGULAR RESOLUTION INTERCEPT OF TRANSMITTED RADIATORS

Frank S. Gutleber, 24 Carriage House La., Little Silver, N.J. 07739

Filed Aug. 26, 1983, Ser. No. 526,848
Int. Cl.[4] G01S *5/02*
U.S. Cl. 342—429 **13 Claims**



1. Receiver apparatus in a multiple access signal communications system including one or more transmitters, comprising in combination:

first antenna means having an omnidirectional antenna beam pattern;

second antenna means having a generally omnidirectional antenna pattern with a single notched portion;

means for scanning said second antenna means to position said notched portion in the direction of said one or more transmitters;

means, responsive to RF signals received by said first and second antenna means, for determining the center of a transmitted radiation pattern from said one or more transmitters for providing an indication of the bearing of said transmitters relative to said receiver apparatus including means for generating a difference RF signal between said RF signals received by said first and second antenna means, means responsive to said difference RF signal for providing a video signal therefrom, means for splitting said video signal into a plurality of pulse signal samples of substantially equal pulse width; and

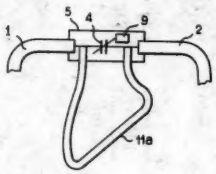
means for determining the pulse signal sample substantially at the mid-point of said plurality of signal samples which thereby indicates the direction of the said transmitted radiation including first means for storing said plurality of pulse signal samples in a predetermined signal state, second means for storing said plurality of pulse signal samples and inverting the signal state of one half of said signal samples to a state opposite from said predetermined signal state, and means for determining the occurrence of the inverted one half signal samples stored in said second means relative to the plurality of pulse signal samples stored in said first means, said occurrence providing an indication of the boresight axis of said transmitted radiation pattern.

4,617,571

TUNED BAND-SWITCHING LOOP ANTENNA

Jean Choquer, Gif sur Yvette, and Thierry Gartner, Brils Sous Forges, both of France, assignors to Societe Technique d'Applicatioon et de Recherche Electronique, France

Filed Apr. 24, 1984, Ser. No. 603,472
Claims priority, application France, Apr. 27, 1983, 83 06948
Int. Cl.[4] H01Q *11/12*
U.S. Cl. 343—744 **3 Claims**



1. A loop antenna comprising:

two arms extending in a first vertical plane and interconnected at their top ends to form a loop by a variable capacitor;

feeding and coupling means to make said loop radiate electromagnetic energy;

an inductor connected in parallel with said variable capacitor, said inductor being formed by a two-wire line having an open end which can be short circuited; and

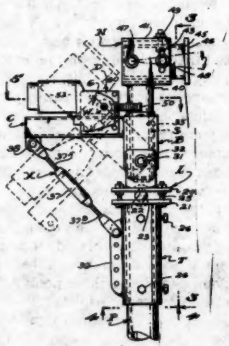
switching means for selectively short circuiting said open end of said two-wire line.

4,617,572

TELEVISION DISH ANTENNA MOUNTING STRUCTURE

Albert Hugo, P.O. Box 87 6325 Carpinteria Ave., Carpinteria, Calif. 93013

Filed Aug. 14, 1984, Ser. No. 640,620
Int. Cl.[4] H01Q *3/08*
U.S. Cl. 343—765 **11 Claims**



1. A mounting structure for a television dish antenna comprising an elongate substantially vertical post with a lower end in fixed position relative to the earth and defining a vertical first axis; a levelling structure comprising a lower part secured in set position on an upper portion of said post, an upper part, a central pivot bearing part between said upper and lower parts and first screw means engaged with and between said upper

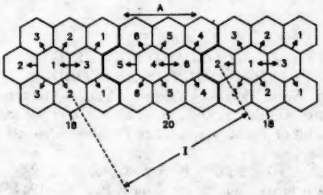
and lower parts to pivot and set said upper part horizontal; an elongate body with an upper outer end and a lower inner end positioned above said levelling structure and defining a longitudinal second axis, coupling means projecting up from said upper part and pivotally mounting said lower end of said body to said upper part about a horizontal third axis, an elongate lever arm projects radially from the upper portion of said body at one side thereof, an elongate axially extensible strut is connected with and extends between said arm and said levelling structure to pivot and set said body about said third axis, a head structure including an elongate shaft part with inner and outer ends concentric with and projecting axially from the upper end of said body for rotation about said second axis, drive means to rotate said shaft relative to the body about said second axis including a driven gear on said shaft, a drive gear rotatably carried by said body and engaging said driven gear and a reversible drive unit carried by the body driving said drive gear, an elongate first carrier part with inner and outer ends at the outer end of said shaft with its longitudinal axis normal to said second axis, a second elongate carrier part with inner and outer end portions extending longitudinally of said first carrier part with its outer end portion projecting from the outer end of said first carrier part, pivot means pivotally connecting the inner end portion of said second carrier part to the inner end portion of the first carrier part for pivotal movement about a horizontal fourth axis spaced above and parallel with said third horizontal axis, a dish antenna mounting plate at the outer end of said second carrier part and second screw means engaged with and between said first and second carrier parts to pivot said second carrier part vertically about said fourth axis.

4,617,573

METHOD FOR OBTAINING A LINEAR CELLULAR ARRAY EMPLOYING COSINE-SQUARED ANTENNA PATTERNS

Allen L. Davidson, Crystal Lake, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 19, 1984, Ser. No. 683,837
Int. Cl.[4] H01Q *21/06*
U.S. Cl. 343—844 **9 Claims**



1. A method for obtaining a linear cellular pattern, over a geographic area, with optimum frequency reuse and minimum co-channel interference, comprising the steps of:

establishing a first, second and third cell module each having a triad of geometrically shaped cells tangentially spaced at substantially 120° about a center cell, each cell having a directional antenna located on the cell perimeter positioned adjacent to said center cell such that at least said antennas of said triad radiate outwardly at approximately 120° from each other;

establishing a first cell cluster by combining said first, second and third cell modules such that said triads of said first and second cell modules are conterminously interleaved and said center cells are merged into a common center cell, and said triad of said third cell module is conterminously interleaved with said first and second cell modules such that one cell of said third triad is merged with said common center cell of said first and second cell modules, and said center cell of said third cell module is merged with one cell of either said first or second cell module such that said cell cluster has a substantially longitudinal semblance;

assigning said first, second and third cell modules a first, second or third frequency;

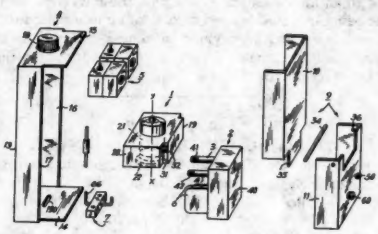
positioning said first cell cluster in a geographic area such that said first cell cluster is aligned with the linear direction of the geographic area to be covered.

4,617,574

INK-JET PRINT HEAD ASSEMBLY

Jean-Claude Millet, and Jean-Louis Reynaud, both of Bourg les Valence, France, assignors to Imaje S.A., Les Valence, France

PCT No. PCT/FR84/00041, § 371 Date Oct. 23, 1984, § 102(e) Date Oct. 23, 1984, PCT Pub. No. WO84/03474, PCT Pub. Date Sep. 13, 1984
PCT Filed Feb. 28, 1984, Ser. No. 676,195
Claims priority, application France, Mar. 7, 1983, 83 03975
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—75 **10 Claims**



1. An ink jet printing head comprising:

a casing having an end wall, top and bottom walls and opposite facing side walls;

a cover for said casing having a stationery upper section and a movable lower section;

a modulator element rigidly fixed to said casing for pinching off and severing a jet of ink, said modulator element having a base with a bore therethrough, a modulator body carried within said bore, and a modulator plate supported by said modulator body;

rotational adjusting means for adjusting the angular position of said modulator body within said base and translational adjusting means for adjusting the axial position of said modulator body within said base;

means carried by said modulator plate of said modulator element for ejecting a stream of calibrated ink drops;

an electrode holder element securely attached to said movable lower section of said cover, said electrode holder element having means for applying an electrostatic charge to said ink drops and means for electrostatically deflecting said ink drops when said cover is adsembled with said casing;

a dump and recovery tube attached to the bottom wall of said casing for collecting and recirculating unused ink drops; and an aperture in said lower wall of said casing through which said stream of calibrated ink drops flow toward a surface to be printed.

4,617,575

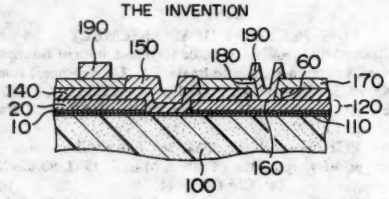
THERMAL HEAD

Moriaki Fuyama; Katsumi Tamura, both of Hitachi; Isao Funyu, Takahagi; Isao Nunokawa, Hitachi; Masanobu Hanazono, Mito, and Shigetoshi Hirastuka, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 30, 1985, Ser. No. 760,623
Claims priority, application Japan, Jul. 30, 1984, 59-160003
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **22 Claims**

1. A thermal head, which comprises an electrically insulating substrate, a glaze layer laid thereon, a heating resistor layer

laid on the glaze layer, a plurality of first layer conductors laid on the heating resistor layer and provided at predetermined distances, a protective film laid on the heating resistor layer, and a plurality of second layer conductors counterposed to the first layer conductors and laid on the first layer conductors



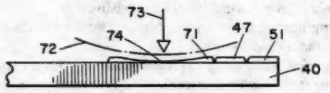
through an interlayer insulating film, the interlayer insulating layer being in a two-layer structure of an inorganic insulating material layer and an organic insulating material layer, the organic insulating material layer being positioned on the second layer conductor side.

4,617,576

THERMAL PRINTHEAD STRUCTURE

Charles R. Moeller, Carlsbad, Calif., assignor to International Totalizator Systems, Inc., San Diego, Calif.

Filed Nov. 26, 1984, Ser. No. 674,776
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **13 Claims**



1. A thermal printhead structure which comprises:
a substrate;
a print element deposited on the substrate;
a means for impacting a material for printing, such as a ticket, against said printhead; and
a wear-resistant layer means deposited on the substrate immediately adjacent to but not on the print element, for receiving the impact of said material for printing and for resisting printhead abrasion caused by said material for printing and abrasive material contacting the printhead
wherein said means for impacting is offset from the print element such that the impact is received mainly on the wear-resistant layer means and immediately adjacent to but not on the print element.

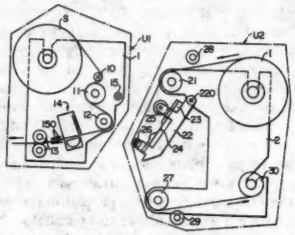
4,617,577

THERMAL-IMAGE-TRANSFER RECORDING APPARATUS

Keiji Takahashi, Kanagawa, and Sakae Fujimoto, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Sep. 15, 1983, Ser. No. 532,734
Claims priority, application Japan, Sep. 16, 1982, 57-140421[U]; Sep. 17, 1982, 57-161909; Sep. 27, 1982, 57-145916[U]
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **15 Claims**

1. A thermal-image-transfer recording apparatus having a recording head responsive to information-dependent signals applied thereto for fusing with heat a thermally fusible ink layer on a base of an ink sheet in the selected pattern of an image and transferring the image of fused ink to a recording sheet superimposed on the ink sheet while the sheets are fed along across the recording head, thereby producing the image dependent on the signals on the recording sheet, said recording apparatus comprising:
(a) a first unit having a passage of travel of the recording sheet;
(b) a second unit having a passage of travel of the ink sheet, one of said first and second units having the recording head and the other unit having a platen roller;
(c) a locking mechanism for actuating said first and second units into and out of engagement with each other; and
(d) a positioning mechanism for positioning said recording head and said platen roller with respect to each other when the image is recorded on the recording sheet with



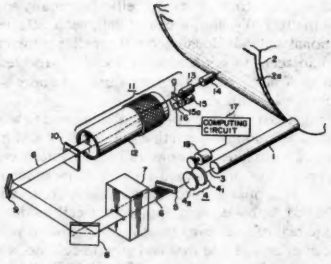
the first and second units engaging with each other, said recording head and said platen roller jointly defining a recording zone, said platen roller being rotatable to feed the ink and recording sheets through said recording zone;
wherein said first unit is fixed and said second unit is movable with respect to said first unit into and out of engagement with the latter; and
wherein said locking mechanism comprises a rail guide mechanism for moving said second unit therealong, a lever pivotably mounted on said second unit, a locking member mounted on said seocnd unit in coaxial relation to said lever, and a pin mounter on said first unit for releasably engaging said locking member.

4,617,578

MULTI-BEAM ZOOM AND FOCUSING LENS SCAN PITCH-ADJUSTING RECORDER

Yasutada Nezu; Yutaka Tamura; Yuuzi Mizuno; Hiroshi Iwamoto; Akihiro Yokota, all of Kyoto, and Kiyoshi Maeda, Osaka, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Feb. 7, 1985, Ser. No. 699,159
Claims priority, application Japan, Feb. 15, 1984, 59-25155; Feb. 17, 1984, 59-27339
Int. Cl.[4] G01D *9/42*; G02B *27/17*; B41B *13/00*; H04N *1/40*
U.S. Cl. 346—108 **10 Claims**



1. A method for exposing a photographic film by a plurality

of modulated laser beams in a scanning image reproduction system, characterized by comprising the following steps of:

modulating a plurality of parallel laser beams independently basing on picture image signals;

converting said plurality of modulated laser beams to a plurality of laser beams each pitch between which is compressed by a beam compressing optical system comprising two lenses which hold convergent points of said laser beams in common; and

focussing said compressed laser beams as a plurality of lines of light points having a predetermined interval between each of them on the surface of recording material placed in the vicinity of the focussing point of said focussing lens.

4,617,579

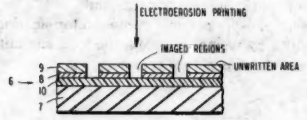
HYDROPHILIC PROTECTIVE COATINGS FOR ELECTROEROSION PRINTING

Krishna G. Sachdev, Wappingers Falls; Ali Afzali-Ardakani, Katonah; Keith S. Pennington, Somers, and Mitchell S. Cohen, Ossining, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 5, 1984, Ser. No. 597,148

Int. Cl.⁴ G01D *15/06*

U.S. Cl. 346—135.1 **24 Claims**



1. Electroerosion recording material comprising:

a non-conductive support member, a thin conductive member on said support member, said conductive member being evaporable in response to being heated in an electroerosion recording process, and an overlayer of protective lubricant composition on the stylus-contacting surface of said material, said lubricant composition comprising conductive particles of high lubricity dispersed in a hydrophilic cross-linked polymeric binder, the ratio of binder to lubricant particles in said overlayer being sufficient substantially to prevent flake-off during handling and use of said material.

4,617,580

APPARATUS FOR RECORDING ON DIFFERENT TYPES OF MEDIUMS

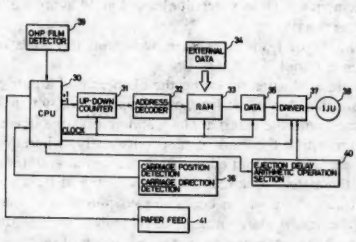
Akira Miyakawa, Tanashi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1984, Ser. No. 641,022

Claims priority, application Japan, Aug. 26, 1983, 58-155000; Aug. 26, 1983, 58-155001; Aug. 26, 1983, 58-155002

Int. Cl.⁴ G01D *18/00, 15/18*

U.S. Cl. 346—136 **10 Claims**



1. A recording apparatus comprising:

recording means for recording an image by attaching dots of a recording material onto a recording medium in accordance with data;

determining means for determining a type of the recording medium; and

control means for controlling a density of the image recorded by said recording means in accordance with a determination result of said determining means in such a manner that a plurality of dots are attached onto a particular type of recording medium for individual pixels in the image and the plurality of dots are shifted by a predetermined amount to permit superposed printing.

4,617,581

INK JET PRINTER OF THE INK-ON-DEMAND TYPE

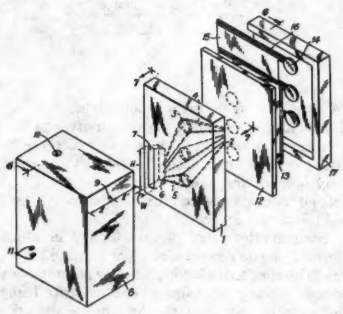
Haruhiko Koto; Junichi Okada; Hiroshi Ishii, and Kenji Sawada, all of Shiojiri, Japan, assignors to Epson Corporation, Tokyo, Japan

Division of Ser. No. 541,628, Oct. 13, 1983, abandoned. This application Aug. 12, 1985, Ser. No. 764,814

Claims priority, application Japan, Oct. 14, 1982, 57-180176; Dec. 7, 1982, 57-215263; Jan. 17, 1983, 58-5501; Jul. 12, 1983, 58-126668; Jul. 20, 1983, 58-132162; Aug. 23, 1983, 58-153660

Int. Cl.⁴ G01D *15/16*

U.S. Cl. 346—140 R **6 Claims**



1. An ink-on-demand type ink jet printer comprising:

a printer head, said printer head including a substrate having a substantially planar surface and an opposing substantially planar surface and a vibratory plate having a cooperating substantially planar surface, the planar surfaces cooperating to define at least one nozzle, pressure chamber and ink supply passage therebetween;

an ink container integrally joined to said printer head, said ink container having a vent hole in an upper portion thereof;

means for pressuring the ink in said pressure chamber; and

means for preventing air bubbles from entering said ink supply passage;

wherein the opposing substantially planar surface of said substrate defines a wall of said ink container.

4,617,582

HEAT-SENSITIVE RECORDING SHEET

Masahiro Miyauchi, and Masahiro Higuchi, both of Tokyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 494,312, May 13, 1983. This application Jun. 19, 1984, Ser. No. 622,246

Claims priority, application Japan, May 14, 1982, 57-82131; Jun. 1, 1982, 57-92154

The portion of the term of this patent subsequent to May 6, 2003, has been disclaimed.

Int. Cl.[4] B41M *5/18*

U.S. Cl. 346—208 24 Claims

1. A heat-sensitive recording sheet having a heat-sensitive coating layer comprising a colorless to light-colored dye precursor as color former and a color developer which causes said dye precursor to develop a color by reacting with said dye precursor when heated, characterized in that benzyl p-hydroxybenzoate is used as said color developer and said heat-sensitive coating layer further comprises a terephthalic acid ester having a melting point of 60° C. or higher and a fatty acid amide or derivative thereof having a melting point of 60° C. or higher.

4,617,583

GATE TURN-OFF THYRISTOR

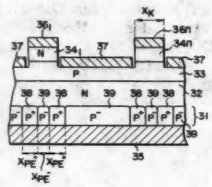
Takashi Shinohe, Kawasaki, and Masayuki Asaka, Miura, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 14, 1984, Ser. No. 671,197

Claims priority, application Japan, Mar. 9, 1984, 59-44123

Int. Cl.[4] H01L *29/74*

U.S. Cl. 357—38 8 Claims



1. A gate turn-off thyristor comprising:

a first emitter layer of a first conductivity type which mainly consists of a low impurity concentration region;

a first base layer of a second conductivity type formed on said first emitter layer;

a second base layer of said first conductivity type formed on said first base layer;

a second emitter layer of said second donductivity type formed on said second base layer and divided into a plurality of emitter strips having a nearly rectangular shape, said nearly rectangularly shaped emitter strips being arranged in a circle such that the lengthwise direction of each rectangularly shaped emitter strip coincides with the radial direction of the circle;

an anode electrode formed on said first emitter layer;

cathode electrodes formed on said emitter strips of said second emitter layer;

a gate electrode formed on said second base layer except on portions of said second base layer that form said PN junctions with said emitter strips; and

a plurality of high impurity concentration regions of said first conductivity type and of a substantially uniform width formed in said first emitter layer, said high impurity concentration regions being formed such that boundary lines of a projection of said rectangularly shaped emitter strips on said first emitter layer, which boundary lines extend in the lengthwise directions of said emitter strips, are located within at least one of said high impurity concentration regions of said first emitter layer and substantially surround a low impurity concentration region in said first emitter layer that is located just below one of said emitter strips.

4,617,584

RESIN ENCAPSULATION TYPE SEMICONDUCTOR DEVICE

Hirotoshi Ikeya, Yokosuka, and Akiko Hatanaka, Sendai, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 28, 1983, Ser. No. 479,481

Int. Cl.[4] H01L *23/30*

U.S. Cl. 357—72 13 Claims

1. A resin encapsulation type semiconductor device provided with a semiconductor element and a resinous encapsulator covering over said semiconductor element, said resinous encapsulator comprising a cured product epoxy resin composition comprising:

(a) a novolac type epoxy resin having an epoxy equivalent of 170 to 300;

(b) a novolac type phenol resin;

(c) an organic phosphine compound; and

(d) an organic phosphorus acid compound in an amount of 0.001 to 10% by weight based on the total amount of the epoxy resin and the phenol resin.

4,617,585

PLASTIC ENCLOSING DEVICE

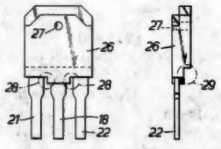
Mitsuru Yasui, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 499,785, May 31, 1983, abandoned. This application Dec. 24, 1985, Ser. No. 814,171

Claims priority, application Japan, May 31, 1982, 57-91174

Int. Cl.[4] H01L *23/12, 23/30, 23/34, 23/12*

U.S. Cl. 357—72 8 Claims



1. A plastic enclosing device installed on an external plate comprising:

an element usable as a circuit element and having a plurality of terminals;

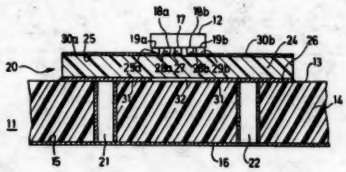
a plurality of leads connected with said terminals of said element; and

a plastic enclosure enclosing the element and a part of said leads, and having at least one main surface which is contacted with the external plate, and at least one side surface from which the leads extend outwardly, wherein a first step portion of said enclosure is formed at an intersection of the at least one main surface and the at least one side surface at a position between said plurality of leads and said external plate in order to increase a surface distance therebetween, and a second step portion of said enclosure is formed on the at least one side surface at a position between the leads.

4,617,586
HIGH-FREQUENCY CIRCUIT COMPRISING AN INTEGRATED CAPACITOR

Bernard Cuvilliers, Herblay, and Philippe Jourdain, Evreux, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 21, 1983, Ser. No. 477,280
Claims priority, application France, Mar. 31, 1982, 82 05551
Int. Cl.[4] H01L *23/14, 23/48, 25/08, 25/12*
U.S. Cl. 357—80 **5 Claims**



1. A high frequency circuit arrangement comprising a semiconductor circuit element having a plurality of terminals secured to an insulative substrate having opposing first and second surfaces bearing conductive means for interconnecting circuit elements, characterized in that said circuit arrangement comprises:

a. a first conductive layer on the first surface of the substrate;

b. a second conductive layer on the second surface of the substrate, said second conductive layer forming a ground plane;

c. a conductively-coated wall defining a hole through the substrate extending between the first and second surfaces, said wall electrically connecting the first and second conductive layers;

d. a semiconductor-mounting dielectric plate having opposing first and second surfaces, said plate being secured to the substrate with its second surface physically contacting the first conductive layer and with its first surface bearing:

1. a third conductive layer overlying at least part of the first conductive layer; and

2. a plurality of conductive elements positioned to make electrical connection with respective ones of the terminals on the semiconductor circuit element, at least one of said conductive elements being electrically connected to the third conductive layer;

said first and third conductive layers forming with the dielectric plate an integrated capacitor for cooperating with the conductively-coated wall and with the at least one conductive element to AC couple the respective terminal of the semiconductor element to the ground plane.

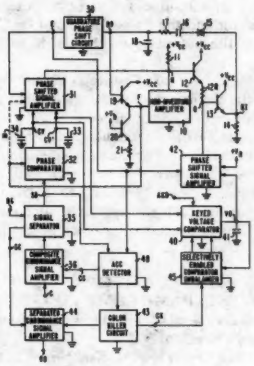
4,617,587
RECOVERY SYSTEM FOR A CONTROL LOOP

Robert L. Shanley, II, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 30, 1984, Ser. No. 676,944
Int. Cl.[4] H04N *9/44*
U.S. Cl. 358—17 **6 Claims**

1. In a control loop including a keyed voltage comparator developing a control voltage output within a predetermined range of amplitudes, said control voltage being subject to utilization in establishing a desired condition of operation of electrical apparatus, wherein an unbalance of voltages of one sense at respective input terminals of said voltage comparator introduces a shift of said control voltage output in the direction of a first edge of said predetermined range whereas an unbalance of voltages at said input terminals of the opposite sense introduces a shift of said control voltage output in the direction of the second edge of said range; said control loop being undesirably subject to a failure mode in which the control voltage output may be driven to one of said edges of said predetermined range without establishing said desired condition of operation; a system for achieving a recovery from said failure mode comprising:

a latching circuit subject to latched operation in a first mode upon sensing of arrival of said control voltage output at said first range edge without establishment of said desired condition of operation, and subject to latched operation in a second mode upon sensing of arrival of said control voltage output at said second range edge without establishment of said desired condition of operation; and



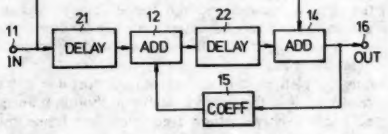
means for coupling said latching circuit to said voltage comparator in such manner that an unbalance of said one sense is established at said input terminals of said voltage comparator when said latching circuit is subject to operation in said second mode, whereas an unbalance of said opposite sense is established at said input terminals when said latching circuit is subject to operation in said first mode; and

wherein said latching circuit is subject to disabling upon establishment of said desired condition of operation.

4,617,588
FEEDBACK TYPE COMB FILTER

Hasatoshi Fukuda, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Nov. 26, 1984, Ser. No. 674,544
Claims priority, application Japan, Nov. 26, 1983, 58-222709
Int. Cl.[4] H04N *9/78*
U.S. Cl. 358—31 **5 Claims**



1. A feedback type comb filter comprising:

a first delay circuit supplied with an input signal which is applied to an input terminal, for delaying the input signal by a predetermined delay time τ_1;

a first adding circuit supplied with an output signal of said first delay circuit;

a second delay circuit supplied with an output signal of said first adding circuit, for delaying the output signal of said first adding circuit by a predetermined delay time T_H;

a second adding circuit supplied with an output signal of said second delay circuit and the input signal which is applied

to said input terminal and is passed through a signal path having a delay time τ_3, for adding the two signals supplied thereto, an output signal of said second adding circuit being obtained through an output terminal as an output signal of said comb filter; and

a feedback path including a coefficient multiplier for multiplying a coefficient k to the output signal of said second adding circuit, said feedback path having a delay time τ_2 and supplying the output signal of said second adding circuit to said first adding circuit through said coefficient multiplier,

said first adding circuit adding the output signal of said first delay circuit and the signal from said feedback path, and supplying the output signal thereof to said second delay circuit,

said delay time τ_1 of said first delay circuit being equal to a sum of the delay time τ_2 of said feedback path and the delay time τ_3 of said signal path,

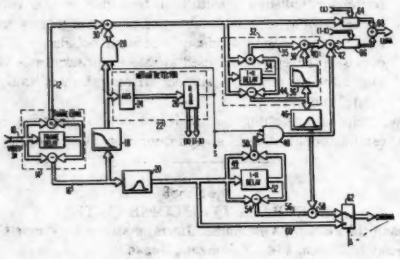
said delay time T_H of said second delay circuit being equal to a value which is smaller than a predetermined time T_P by said delay time τ_2 of said feedback path, said predetermined time T_P corresponding to a frequency interval between center frequencies of two adjacent pass bands in a comb filter characteristic of said comb filter.

4,617,589

ADAPTIVE FRAME COMB FILTER SYSTEM

Hermann J. Weckenbrock, Bordentown, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 17, 1984, Ser. No. 682,765
Int. Cl.[4] H04N 9/64
U.S. Cl. 358—31 **11 Claims**



1. An adaptive frame comb filter system for comb filtering video signals, comprising:

a source of video signals;

a frame comb filter coupled to said source for generating at a first output port, a first output signal corresponding to the sum of non-delayed and frame delayed signals, and generating at a second output port a second output signal corresponding to the difference of non-delayed and frame delayed signals;

means coupled to the second output port for extracting relatively low frequency interframe motion-induced signals and relatively high frequency interframe motion-induced signals;

means responsive to said relatively low frequency interframe motion-induced signals for generating a control signal on the occurrence of such signals;

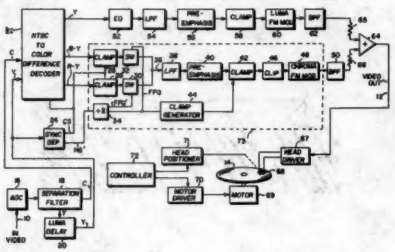
means including means for combining said relatively low frequency and relatively high frequency interframe motion-induced signals with said first output signal to produce a substantially motion-corrected first output signal and including means responsive to said control signal for selectively coupling at least said relatively high frequency interframe motion-induced signals to said combining means only when said relatively low frequency motion-induced signals occur.

4,617,590

CLAMPING CIRCUIT FOR VIDEO SIGNALS

Lynn D. Dann, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 4, 1985, Ser. No. 697,660
Int. Cl.[4] H04N 9/72
U.S. Cl. 358—34 **5 Claims**



1. A video circuit for processing color signals in a line sequential video system, said circuit comprising:

means for generating a pair of color video signals;

means for setting the dc voltage level of one color signal relative to the other color signal such that an offst voltage exists between them;

means for combining said offset color video signals into a line sequential signal;

means for ac coupling said line sequential signal between stages of the circuit whereby its dc level is lost; and

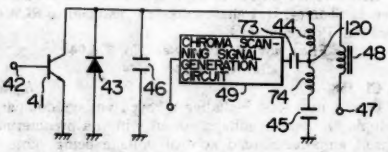
means for reestablishing a dc voltage level for said line sequential signal by clamping one of said color video signals to a predetermined dc level thereby utilizing the offset voltage between it and the other color video signal to set the other color video signal to another predetermined dc level.

4,617,591

CHROMA SCANNING CIRCUIT FOR USE IN BEAM INDEX TYPE COLOR PICTURE REPRODUCING APPARATUS

Fumio Inoue, Yokohama; Masahiro Eto, Fujisawa, and Takashi Kubota, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 4, 1985, Ser. No. 689,005
Claims priority, application Japan, Jan. 9, 1984, 59-896
Int. Cl.[4] H04N 9/24
U.S. Cl. 358—67 **15 Claims**



1. A chroma scanning circuit used in a beam index type color picture reproducing apparatus having a deflection circuit provided with a horizontal output transistor, a horizontal deflection coil connected to an output of said horizontal output transistor, and a resonance capacitor connected to an output of said horizontal output transistor, and having an index tube in which a single electron beam is deflected by a horizontal deflection magnetic field generated by said deflection circuit, said chroma scanning circuit comprising:

an inductance element connected in series to said horizontal deflection circuit;

an impedance element connected at its one end to a junction between said horizontal deflection coil and said inductance element; and

a chroma scanning signal generating means connected to the other end of said impedance element and for generating a chroma scanning signal.

4,617,592

VIDEO RETOUCHING SYSTEM

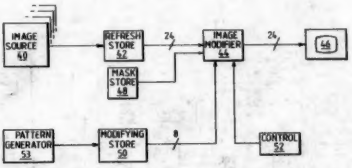
Lindsay W. MacDonald, Irvine, Calif., assignor to Crosfield Electronics Limited, London, England

Filed Mar. 8, 1983, Ser. No. 473,400

Claims priority, application United Kingdom, Mar. 11, 1982, 8207152

Int. Cl.⁴ H04N *1/40*

U.S. Cl. 358—80 **5 Claims**



1. A video image modifying system comprising:

a first store for signals representing image pixel values;

a second store for signals for the same image pixels;

a display monitor responsive to pixel signals and providing a corresponding display;

a modifying store for multi-bit pixel values, each such pixel value corresponding to an image pixel;

display modifying means for receiving signals from the modifying store and for receiving and combining pixel signals from the first and second stores and applying the resultant pixel signals to the display monitor; and

control means having an output connected to the display modifying means and establishing a combining function determining the response of the display-modifying means to the values from the modifying store;

wherein the display modifying means, operates to provide display control pixel signals which result from functionally combining the corresponding pixel values from the first and second stores under the control of the modifying value from the modifying store and the combining function established by the control means.

4,617,593

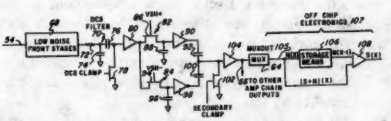
VISIBLE AND NEAR INFRARED IMAGING SYSTEM

Dana Dudley, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 7, 1984, Ser. No. 638,832

Int. Cl.⁴ H04N *7/18, 5/33*

U.S. Cl. 358—113 **11 Claims**



1. An imaging system comprising:

(a) an optical system for focusing energy emanating from a scene;

(b) a detector means in the optical path of the optical system for receiving the focused energy and producing substantially noise free electrical signals representative of the scene, the detector means including a plurality of detector elements arranged in rows and columns, each element having a solid state switch and a temperature sensitive capacitor operatively connected to the switch, said switch for selectively charging the capacitors; and

(c) a plurality of amplifier chain circuit means operatively connected to the columns of detector elements for reducing substantially the reset noise of the detector means in the electrical signals.

4,617,594

SIGNAL GENERATOR CIRCUIT

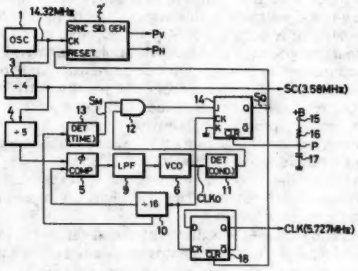
Koichi Katagiri, Tokyo; Yoshihiro Hanamoto, Hyogo; Satoru Maeda, Kanagawa, and Ikuo Taniguchi, Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Corp. and Sony Corporation, both of Tokyo, Japan

Filed Apr. 12, 1985, Ser. No. 722,355

Claims priority, application Japan, Apr. 13, 1984, 59-74365

Int. Cl.⁴ H04N *5/06*

U.S. Cl. 358—150 **7 Claims**



1. A signal generator circuit comprising:

reference signal oscillator means for producing a reference signal having a series of rising edges;

means responsive to said reference signal for generating a horizontal synchronization signal synchronized with said reference signal;

frequency-dividing means responsive to said reference signal for producing a color sub-carrier signal having a series of rising edges;

a phase-locked loop circuit responsive to said sub-carrier signal and including a voltage-controlled oscillator, said voltage-controlled oscillator producing an output signal having a series of rising edges, at least one rising edge of said sub-carrier signal coinciding with a rising edge of said signal from said voltage-controlled oscillator, said output signal from said voltage-controlled oscillator being synchronized with said sub-carrier signal;

means for detecting a time at which a rising edge of said sub-carrier signal coincides with a rising edge of said output signal of said voltage-controlled oscillator;

means for generating a clock signal synchronized with said output signal of said voltage-controlled oscillator and having a series of falling edges;

means for generating power supply voltage, said power supply voltage having a rising edge upon application to said signal generator circuit; and

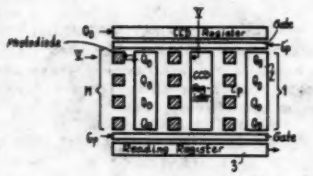
means for detecting said rising edge of said power supply voltage;

said horizontal synchronization signal generating means and said clock signal generating means being controlled by said time detecting means and said rising edge detecting means so as to ensure that the rising edge of said horizontal synchronization signal avoids coincidence with a rising edge of said clock signal.

4,617,595
PROCESS AND APPARATUS FOR ANALYZING A PHOTOSENSITIVE DEVICE HAVING AN INTERLINE-TRANSFER STRUCTURE

Jean-Luc Berger, Grenoble, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 12, 1984, Ser. No. 660,443
Claims priority, application France, Oct. 21, 1983, 83 16792
Int. Cl.[4] H04N 3/14
U.S. Cl. 358—213 7 Claims



2. A process for analyzing a light sensitive device having an interline transfer structure, this device comprising a photosensitive matrix of N columns of M photosensitive points receiving signal charges, each photosensitive point of a single column being connected to a stage of a charge transfer shift register that transfers signal charges from the photosensitive points towards a reading register, perpendicular to the shift registers, said process comprising the following steps:

injecting a drive charge into each stage of the shift registers, during a preceding reading time;

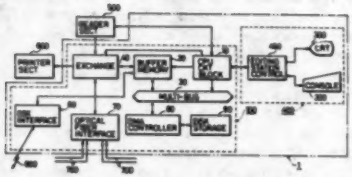
transferring the drive charge from the shift registers to the photosensitive points where said charge is superimposed on the signal charges;

transferring charges constituted by the signal charge plus the drive charge from the photosensitive points to the shift registers to be read in a conventional manner.

4,617,596
IMAGE PROCESSING APPARATUS

Tadashi Yoshida, Tokyo; Katsuichi Shimizu, Kunitachi; Shinobu Arimoto; Katsuyoshi Maeshima, both of Tokyo; Nao Nagashima, Yokohama, and Asao Watanabe, Higashi Kurume, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 29, 1983, Ser. No. 537,120
Claims priority, application Japan, Oct. 5, 1982, 57-173869
Int. Cl.[4] H04N 1/40
U.S. Cl. 358—280 33 Claims



1. An image processing apparatus comprising:

input means for entering image information;

means for setting a processing procedure for processing the image information entered from said input means, said processing procedure including specific data rewritable in the form of numerical data;

memory means for storing the processing procedure set by said setting means;

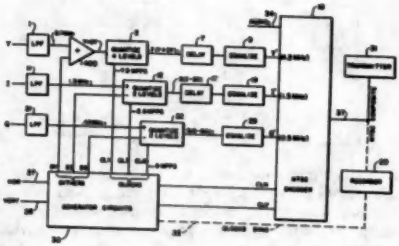
means for rewriting the specific data including the processing procedure stored in said memory means in the form of numerical data suitable for a desired image processing; and

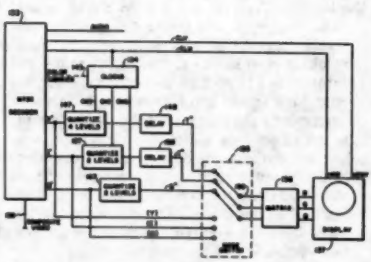
means for processing the image information entered from said input means in accordance with the processing procedure including the numerical data rewritten by said rewriting means.

4,617,597
COMPATIBLE COLOR TELEVISION WITH REGENERABLE SIGNALS

Bernard Lippel, West Long Branch, N.J., assignor to Quanticon Inc., West Long Branch, N.J.

Division of Ser. No. 354,138, Mar. 5, 1982, Pat. No. 4,568,966, which is a continuation-in-part of Ser. No. 224,679, Jan. 13, 1981, Pat. No. 4,460,924, Continuation of Ser. No. 897,860, Apr. 19, 1978, Pat. No. 4,275,411. This application Oct. 4, 1985, Ser. No. 784,850
The portion of the term of this patent subsequent to Jul. 17, 2001, has been disclaimed.
Int. Cl.[4] H04N 11/14
U.S. Cl. 358—310 24 Claims





1. Signalling apparatus generating a regenerable composite signal sufficient for a colored television picture and interchangeable with another composite signal for display of said colored picture on a television receiver;

said another composite signal comprising a set of analog video signals, each characterized by samples allowed any amplitude in a range of amplitudes;

said apparatus comprising:

means for obtaining a set of signals equivalent to the set of analog video signals of said another composite signal;

dither-quantizing means modifying said equivalent set by combining a signal with dither and by quantizing samples of the combined signal according to plural discrete values of amplitude; and

encoder means for incorporating the modified set of signals into a composite signal compatible with said television receiver.

18. An improved video record storing color television information and interchangeable with another record for playing on a reproducer;

said another record storing said television information en-

coded in terms of a first composite signal comprising a set of analog video components, each said component confined to a band of frequencies and corresponding to samples having a continuous range of possible amplitudes;

said improved record storing said television information encoded in terms of a regenerable composite signal comprising video components, including at least one component having substantially the same bandwidth as a corresponding component of said first composite signal but corresponding to samples quantized according to more than one quantum level of amplitude;

said reproducer detecting and processing said another and said regenerable composite signals in the same manner to display the recorded television information.

4,617,598
ROTARY HEAD MAGNETIC RECORDER/REPRODUCER

Keiichirou Tsuruoka, and Ryo Minohara, both of Hirakata, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

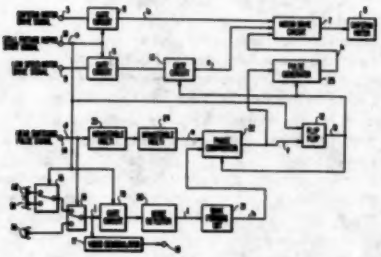
PCT No. PCT/JP83/00160, § 371 Date Jan. 25, 1984, § 102(e) Date Jan. 25, 1984, PCT Pub. No. WO83/04360, PCT Pub. Date Dec. 8, 1983

PCT Filed May 25, 1983, Ser. No. 588,864

Claims priority, application Japan, May 25, 1983, 57/89026

Int. Cl.⁴ H04N *5/782*

U.S. Cl. 360—10.3 **7 Claims**



1. A rotary head type magnetic recording and reproducing apparatus for recording and reproducing a video signal sequentially on a magnetic tape driven by a capstan by alternately using two rotary heads provided on a rotating body, said two heads having head gap angles which are slightly different from each other and which carry out azimuth recording such that each field of a frequency modulated video signal is reproduced by following a record locus which is oblique to the length of the magnetic tape, said apparatus comprising:

(a) a means for driving said magnetic tape at a speed which is lower than the tape speed used in a recording mode when said apparatus is reproducing still pictures;

(b) at least one additional rotary magnetic head for reproducing still pictures, provided on said rotating body, and having a head gap angle which is the same as that of one of said two rotary magnetic heads, said apparatus reproducing one recording track repeatedly by using two of said rotary magnetic heads having a same head gap angle when said magnetic tape is moving slowly and stopped;

(c) a means for detecting a noise generation section within reproduced signals of at least one magnetic head;

(d) a means for comparing the phase difference between the signal of said means for detecting and a pulse signal synchronized with the rotational phase of said rotating body when an output of said means for detecting occurs within a predetermined rotational phase position of said rotating body;

(e) a means for stopping the travel of said magnetic tape after driving a specified length of said magnetic tape responding to the output of said means for comparing when said tape is moving slowly by said means for driving.

4,617,599
PCM SIGNAL RECORDING/REPRODUCING APPARATUS

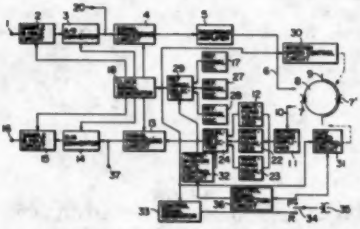
Takaharu Noguchi; Masaharu Kobayashi; Takao Arai, and Toshifumi Shibuya, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 15, 1984, Ser. No. 620,893

Claims priority, application Japan, Jun. 15, 1983, 58-105880; Jun. 15, 1983, 58-105882; Jun. 17, 1983, 58-107699; Sep. 14, 1983, 58-168154

Int. Cl.⁴ G11B *5/00, 5/09*

U.S. Cl. 360—32 **10 Claims**



1. A recording/reproducing apparatus in which an analogue signal is sampled at a selected sampling frequency, converted into a PCM signal by digitizing the samples in accordance with a predetermined quantization bit number, and recording said PCM signal on a moving recording medium and reproducing said PCM signal therefrom by means of a recording head, comprising:

means for generating a clock signal having a frequency which can be varied selectively in accordance with said selected sampling frequency and quantization bit number at which the analogue signal is converted to a PCM signal;

means for processing the digital signal to be recorded and reproduced by using said clock signal; and

means for controlling the relative speed of the recording head and the recording medium in dependence on said selected sampling frequency and said predetermined quantization bit number.

4,617,600
MAGNETIC HEAD HAVING A THIN STRIP OF MAGNETORESISTIVE MATERIAL AS A READING ELEMENT

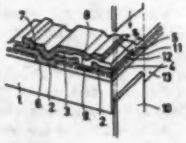
Gerardus H. J. Somers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 26, 1984, Ser. No. 593,073

Claims priority, application Netherlands, Apr. 5, 1983, 8301188

Int. Cl.⁴ G11B *5/30*

U.S. Cl. 360—113 **3 Claims**



1. In a magnetoresistive head for reading analog information

on a track of a recording medium wherein the head is comprised of a magnetic yoke having first and second outer arms and a central arm between said outer arms, the pole faces of the central and first outer arm being in a common plane, whereby the recording medium is adapted to be moved adjacent said yoke in a direction parallel to said common plane, and a strip of magnetoresistive material is coupled to said yoke at a position spaced from said plane, whereby said strip defines a reading element, the improvement wherein said second outer arm has a pole face spaced from said plane to define a gap between said plane and the pole face of said second outer arm, said arms being separated in part by non-magnetic layers, the pole face of said second outer arm being at a greater distance from said recording medium than the pole faces of said first outer and central arms, whereby magnetic flux arising from information on said recording medium at a first frequency is dissipated in said gap to a greater extent than magnetic flux arising from information on said recording medium at a second higher frequency to thereby reduce magnetic flux coupled to said strip at said first frequency.

4,617,601

MAGNETO-OPTICAL RECORDING MEDIUM HAVING RECORDING GUIDE TRACKS

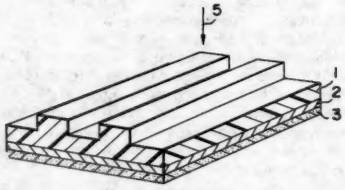
Motoharu Tanaka, Numazu, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed May 3, 1983, Ser. No. 491,141

Claims priority, application Japan, Jun. 18, 1982, 57-103937

Int. Cl.[4] G11B *7/26, 5/82*

U.S. Cl. 360—131 13 Claims



1. A magneto-optical recording medium, comprising:

a monolithic, light-transparent, planar, non-metallic, recording medium base having a flat surface on one side thereof and having a dentate surface on the opposite side thereof, said dentate surface defining a grooved guide track and teeth between adjacent groove portions of said grooved guide track, the entirety of said recording medium base, including said teeth, being made of a single light-transparent non-magnetic material;

a vertically anisotropic magnetic film layer coated directly on said flat surface and being disposed on the opposite side of said base from said dentate surface, said magnetic film layer being magnetizable anisotropically in a direction normal to said flat surface of said base, said magnetic film layer having a mirror surface in contact with said flat surface of said base and being effective to reflect a laser beam that is directed through said base from said opposite side thereof and against said mirror surface,

the thickness of said base being less at said grooved guide track than at said teeth so that the reflectance of said base is different at said grooved guide track and at said teeth, respectively whereby tracking is performed by detecting said difference in reflectance.

4,617,602

PROTECTIVE PLUG FOR DISTRIBUTOR STRIPS

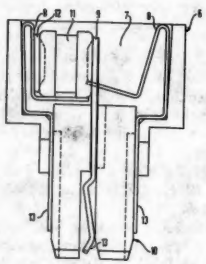
Franz Dolansky, Munich, and Ewald Steiner, Berg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 3, 1985, Ser. No. 719,330

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1984, 3412452

Int. Cl.[4] H02H *9/06*

U.S. Cl. 361—119 4 Claims



1. A protective element system, comprising:

a distributor strip having

a plurality of double terminal post means for connection of electrical conductors arranged in two rows;

upwardly open receptacle chamber means between the two rows in an upper portion of the distributor strip;

contact springs connected to the respective double terminal post means at outer sides of the receptacle chamber means; and

portions of a grounding rail projecting into the receptacle chamber means between the contact springs opposite one another in the chamber means;

a protective element having

a lower part designed as a plug means for insertion into the receptacle chamber means of the distributor strips;

an upwardly open receptacle chamber means provided in the protective element for accommodating surge arresters at an upper part thereof;

one-piece contact springs each having first portions opposite one another at sides of the receptacle chamber means and second portions extending to the plug means, and a one-piece grounding rail having a first portion projecting into the receptacle chamber means between the contact springs and a second portion projecting into the plug means;

the second portion of each of the contact springs and the second portion of the grounding rail directly abutting the contact springs and the grounding rail respectively of the receptacle chamber means of the distributor strip in which the protective element is plugged; and

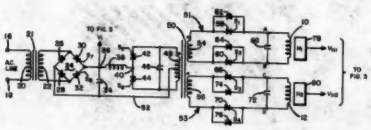
the first portion of each of the contact springs in the receptacle chamber means of the protective element having an integral free leg portion bent at approximately a right-angle with respect to remaining portions of the contact spring and situated adjacent a floor of the chamber means, a leading edge of the free leg being pressed in spring-like fashion against the grounding rail when a surge arrester is not present, and a length of the free leg being dimensioned such that after insertion of a surge arrester with an associated solder spacer, a spacing between said leading edge and the grounding rail is smaller than a thickness of the solder spacer.

4,617,603

DEGAUSSING SYSTEM FOR BULK DEMAGNETIZATION OF PREVIOUSLY MAGNETIZED MATERIALS

Ronald R. Johnson, Shorewood, and Randall K. Rieckenberg, Minneapolis, both of Minn., assignors to IXI Laboratories, Inc., Shorewood, Minn.

Filed Feb. 27, 1985, Ser. No. 706,134
Int. Cl.[4] H01F *13/00*
U.S. Cl. 361—149 7 Claims



1. Apparatus for demagnetizing items exhibiting a remanent magnetic field comprising:

(a) a hollow chamber made from a non-ferromagnetic material that is substantially transparent to magnetic fields, said chamber being surrounded at least over a part of its surface by first and second coils, said first and second coils being orthogonally disposed relative to one another and each forming a part of first and second resonant tank circuits;

(b) a source of current pulses for stimulating said tank circuits;

(c) controllable switching means coupled between said first and second resonant tank circuits and said source of current pulses; and

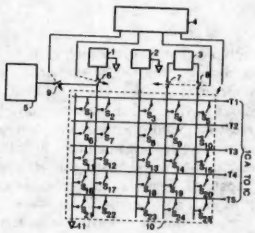
(d) microprocessor means coupled to said controllable switching means for rendering said switching means conductive and nonconductive at preprogrammed times to maintain a predetermined phase relationship between the magnetic fields produced by currents flowing through said first and second coils.

4,617,604

METHOD FOR DRIVING A RELAY

Yoh Narimatsu, Koganei, and Minoru Niizaki, Hachioji, both of Japan, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 7, 1985, Ser. No. 689,358
Claims priority, application Japan, Jan. 27, 1984, 59-13970
Int. Cl.[4] H01H *47/00*
U.S. Cl. 361—160 3 Claims



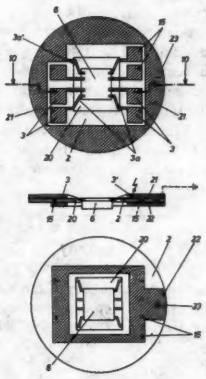
1. A method for driving a relay comprising the steps of, driving the relay in dry switching mode for general measurement, driving the relay intermittently in wet switching mode in order to clean relay contact areas.

4,617,605

CARRIER ELEMENT FOR AN IC MODULE

Werner Obrecht, Wielenbach; Yahya Haghiri-Tehrani, and Joachim Hoppe, both of Munich, all of Fed. Rep. of Germany, assignors to GAO Gesellschaft fur Automation und Organisation, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 396,488, Jul. 8, 1982, abandoned. This application Apr. 24, 1985, Ser. No. 726,818
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1981, 3130324
Int. Cl.[4] H05K *1/18*
U.S. Cl. 361—220 3 Claims



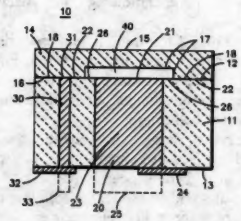
1. In a card having an embedded integrated circuit (IC) module electrically connected by a plurality of leads to individual galvanic contact pads exposed to the surface of the card for communicating with said module, the improvement comprising an electrically conductive ring surrounding the contact pads and being electrically separated from said contact pads, and means on said ring associated with each pad for defining a local gap across which static charges can flow from the contact pad to the conductive ring, the electrically conductive ring and the gaps being covered by an electrically insulating card layer that effects exposure of the pads.

4,617,606

CAPACITIVE PRESSURE TRANSDUCER

Peter J. Shak, and Roland K. Ho, both of Hoffman Estates, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 31, 1985, Ser. No. 696,933
Int. Cl.[4] G01L *9/12*
U.S. Cl. 361—283 16 Claims



1. A capacitive pressure transducer comprising:

a nonconductive base having external top and other surfaces,

a conductive first capacitive electrode bonded to said base

and having a top external surface forming part of said base external top surface, the first electrode top external surface effectively substantially surrounded by nonconductive coplanar portions of said base top surface, and

diaphragm means having top and bottom surfaces with said diaphragm bottom surface joined to said base top surface, a recessed portion of said diaphragm bottom surface spaced apart from and facing said first capacitive electrode top external surface and forming a second capacitive electrode movable with respect to said first electrode in response to sensed pressure variations, coplanar nonrecessed portions of said diaphragm bottom surface peripheral to said recessed portion being bonded to said nonconductive coplanar portions of said base top surface,

said first electrode comprising a preformed metallic component embedded in said base, said first electrode top external surface being coplanar with said base top surface nonconductive coplanar portions, and said first electrode having a conductive projecting portion, effectively integral with said first electrode top external surface, embedded in said base and effectively extending from said first electrode top external surface through said base to at least said base other surface.

4,617,607

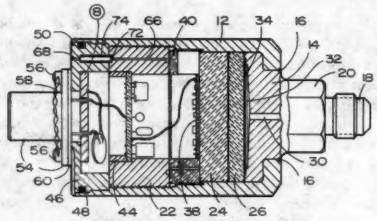
HIGH PRESSURE CAPACITIVE TRANSDUCER

Kyong Park, Chatsworth, and Hung-Chih Chen, Cerritos, both of Calif., assignors to Kavlico Corporation, Chatsworth, Calif.

Filed Dec. 10, 1985, Ser. No. 807,258

Int. Cl.[4] G01L *9/12*

U.S. Cl. 361—283 **18 Claims**



1. A simple and reliable high pressure transducer comprising:

a capacitive pressure transducer made of two closely spaced insulating plates of low mechanical hysteresis material, said plates each having a layer of conductive material on their opposed faces forming electrodes which are spaced slightly apart from one-another, and at least one of said plates being a diaphragm which is flexible under high pressure to deflect toward the other plate and change the capacitance between said electrodes;

a high pressure fitting for mounting and enclosing said capacitive transducer, said high pressure fitting including a coupling for connecting to a source of high pressure fluid, and a high pressure chamber having an extent comparable to that of the insulating diaphragm;

a thin flexible metal diaphragm bonded to said fitting and sealing said high pressure chamber and blocking high pressure fluid from said transducer; and

means for mounting said transducer within said fitting with the insulating diaphragm in firm engagement with said flexible sheet metal diaphragm, whereby, when the high pressure applied to said coupling changes, the deflection of said sheet metal member and insulating diaphragm change correspondingly, and the resultant changed output capacitance of the transducer indicates the new pressure level.

4,617,608

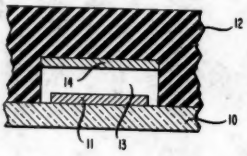
VARIABLE GAP DEVICE AND METHOD OF MANUFACTURE

Greg E. Blonder, Maplewood; Angelo A. Lamola, Warren, and Robert A. Lieberman, New Providence, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 687,192, Dec. 28, 1984, abandoned. This application Jun. 13, 1985, Ser. No. 744,382

Int. Cl.[4] H01G *5/18, 7/00*; G01L *9/00*

U.S. Cl. 361—291 **29 Claims**



19. A variable capacitance device comprising:

a first body including a first electrode formed on one surface thereof, said electrode comprising two interdigitated electrode portions which are capacitively coupled together;

a second body mounted over the first body, the said second body including a cavity formed therein which is positioned over said first electrode and which has a surface opposite the said electrode;

at least one of said bodies being flexible so that the body can be deformed and the gap between the said surface of the cavity and the electrode portions can be varied while the gap in the undeformed state is no greater than 30 μm.

4,617,609

ELECTRIC CAPACITOR IN THE FORM OF A CHIP COMPONENT AND METHOD FOR MANUFACTURING SAME

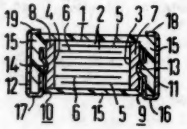
Ferdinand Utner, Regensburg, and Herbert Bolz, Wiernsheim-Serres, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 4, 1985, Ser. No. 707,591

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1984, 3412492

Int. Cl.[4] H01G *1/14, 4/10, 7/00*

U.S. Cl. 361—310 **15 Claims**



1. A capacitor chip adapted for attachment to a printed circuit board by soldering using solder flux and a subsequent cleaning agent comprising:

a capacitor member having at least one metal layer electrically connected to a metal plating at one end face of said capacitor member and at least one other metal layer electrically connected to a metal plating at an opposite end face of said capacitor member, said metal layers having plastic dielectric material therebetween;

two metal bands having interior portions respectively electrically connected to said platings forming current leads for said capacitor chip;

an encapsulation envelope consisting of high temperature resistant plastic impervious to molten solder, said solder flux and said cleaning agent surrounding said capacitor member and said interior portions of said bands;

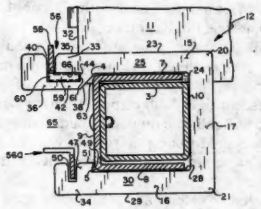
said bands each having respective exterior portions bent around and conforming to a portion of the exterior surface of said encapsulation envelope and forming a plurality of soldering surfaces for said capacitor chip, and each band having a narrowed neck disposed between said interior and exterior portions for substantially thermally isolating said interior portion and said capacitor member from heat generated during soldering of said exterior portion; and

adhesion promotor disposed between each of said metal layer and said metal plating and those portions of said metal band and said encapsulation envelope in contact therewith.

4,617,610
PRINTED WIRING BOARD RETAINER

Milan Zrnich, Bensenville, Ill., assignor to GTE Communication Systems Corp., Northlake, Ill.

Filed Nov. 12, 1985, Ser. No. 797,099
Int. Cl.[4] H05K 7/14
U.S. Cl. 361—415 **14 Claims**



1. A retainer in combination with a plurality of printed wiring boards mounted a file including an open front face through which a plurality of printed wiring boards are inserted, said file including at least a first and a second support arm, a front support bar connected between a front end of each of said support arms and engaging a lower edge of each of said printed wiring boards to support said boards, said retainer comprising:

a plurality of clips clipped to said support bar at predetermined positions therealong;

an upper arm included in each of said clips, said arm including an extension extending forward of a front edge of each of said printed wiring boards;

a retainer slot formed in each of said upper arms; and

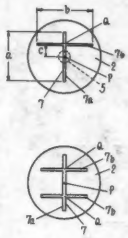
a retainer bar of rigid construction positioned within said retainer slots, said bar positioned above said printed wiring board lower edges and adjacent said printed wiring board front edges, whereby to prevent movement of said printed wiring boards out of said file.

4,617,611
ELECTROLYTIC CAPACITOR

Kengi Miura, Kyoto, and Norikazu Iida, Uji, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

PCT No. PCT/JP83/00327, § 371 Date Jun. 4, 1982, § 102(e) Date Jun. 4, 1984, PCT Pub. No. WO84/01468, PCT Pub. Date Apr. 12, 1984
PCT Filed Oct. 3, 1983, Ser. No. 618,400
Claims priority, application Japan, Oct. 4, 1982, 57-174349
Int. Cl.[4] H01G 9/00
U.S. Cl. 361—433 **4 Claims**

1. An electrolytic capacitor containing a capacitor element in a case, wherein a safety vent is constituted by providing on a bottom face of said case a first narrow straight groove which passes through the center of said bottom face of said case and a second said first narrow groove between the ends thereof at

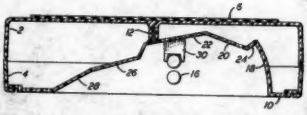


a crossing point outside a winding center part of said capacitor element and is longer than said first narrow groove.

4,617,612
HIGH EFFICIENCY TASK LIGHTING FIXTURE

John C. Pritchett, 4777 Enders Rd., Manlius, N.Y. 13104

Filed Jan. 22, 1985, Ser. No. 693,355
Int. Cl.[4] F21M 3/20; F21V 7/14
U.S. Cl. 362—33 **4 Claims**



1. An adjustable lamp fixture comprising a housing having a top wall and a bottom wall parallel to said top wall, said bottom wall having a circular opening therein;

a light concentrating, asymmetric open reflector having a circular flange thereon adapted for mating engagement with said bottom wall for rotatably mounting said reflector in said bottom wall to allow rotational adjustment of said reflector relative to said housing about an axis perpendicular to said bottom wall while maintaining said flange parallel to said bottom wall; and,

socket means adapted for receiving an elongated lamp for mounting said lamp in a position such that the longitudinal axis of the lamp is parallel with the bottom wall of said housing.

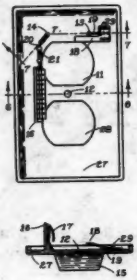
4,617,613
ILLUMINATED ELECTRICAL OUTLET COVER PLATE

Keith Q. Rice, 27025 W. 55th S. Rte. 1, Viola, Kans. 67149

Filed Jan. 22, 1985, Ser. No. 693,528
Int. Cl.[4] F21V 33/00
U.S. Cl. 362—95 **2 Claims**

1. An illuminated cover plate for replacing a non-illuminated cover plate of an electrical outlet, said outlet having at least one electrical outlet device with at least one feed terminal screw head and a grounded support bracket, comprising a body portion molded from a dielectrical plastic material having; openings formed for receiving a portion of the electrical outlet device, one or more tentacular electrical conductors with spring properties mounted on an insulator on the back of the cover plate, the tentacular electrical conductors located and designed in such a manner as to make proper automatic electrical contact with at least one feed terminal screw head on the electrical outlet device when installed on the outlet with the same attachment means used for the non-illuminated cover plate, one or more tantacular electrical conductors with spring properties mounted on the back of the cover plate and located and designed in such a manner as to make proper automatic

electrical contact with the grounded electrical outlet support bracket when installed on the outlet with the same attachment means used for the non-illuminated cover plate, an illuminating



device on the cover plate connected by an appropriate electric circuit to the feed and ground pick-up tentacular electrical conductors.

4,617,614

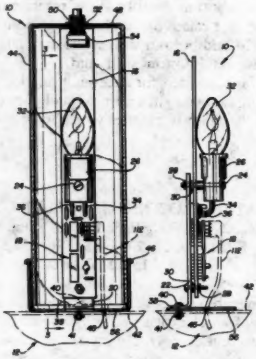
ELECTRIC LIGHT FIXTURE

Gabor Lederer, 92 Kansas St., Hackensack, N.J. 07601

Filed Sep. 16, 1985, Ser. No. 776,384

Int. Cl.[4] F21P *1/02*; F21V *35/00*

U.S. Cl. 362—212 **11 Claims**



1. An electric light fixture comprising:

(a) a circuit board of planar, elongated configuration;

(b) a programmable electronic timer circuit supported on said circuit board and connected to a source of electric power;

(c) a light bulb receptacle for receiving an electric programmable light bulb and electrically connected to the electronic timer circuit; and

(d) a bracket of planar, elongated configuration and of lesser length than the circuit board and disposed in close spaced planar parallelism with the circuit board for supporting the circuit board and light bulb receptacle as a unitary structure.

4,617,615

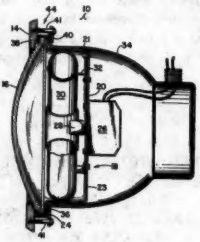
POOL LIGHT

James Eychaner, 68-030 Estio Rd., Cathedral City, Calif. 92234

Continuation of Ser. No. 503,613, Jun. 13, 1983, abandoned. This application Dec. 7, 1984, Ser. No. 682,561

Int. Cl.[4] F21S *5/00*

U.S. Cl. 362—216 **6 Claims**



1. An improved pool light housing assembly comprising:

a pool light housing mounted within a pool having a generally cylindrical configuration;

a fixture having a generally dish-shaped configuration sized to be received within said housing mounted within a pool;

a fluorescent light bulb disposed within said fixture;

an electrical ballast mounted to said fixture and adapted to be connected to an electrical power. source;

means for securing said fluorescent light bulb to said fixture;

a lens sized to extend about said fixture;

means extending about said lens for sealing said lens to said housing; and

a flange formed on said fixture adapted to cooperate with said sealing means to seal said fixture to said housing.

4,617,616

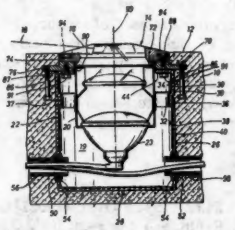
AIRPORT RUNWAY LIGHT HOUSING AND METHOD OF INSTALLATION

Gaylord E. Juell, 762 East St., North, Suffield, Conn. 06078, and Robert E. Lambert, 26 Oakwood St., Enfield, Conn. 06082

Filed Aug. 28, 1985, Ser. No. 770,536

Int. Cl.[4] F21V *29/00*

U.S. Cl. 362—267 **15 Claims**



1. A housing for enclosing at least a portion of an aircraft guidance light fixture whereby said light fixture may be disposed in a predetermined position relative to the surface of a runway structure and oriented in a predetermined direction for guidance of aircraft relative to said runway structure, said housing comprising a generally cylindrical canister having a bottom wall and a top wall including an annular rim defining an opening into an interior space of said housing, said housing including a first section having a generally cylindrical side wall having an inner surface of a first diameter; and

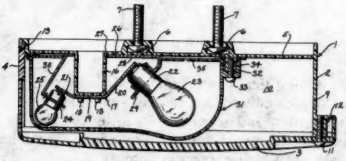
a second section of said housing having a generally cylindrical side wall having an outer surface of a second diameter and configured in such a way that said housing may be cut to separate said first section from said second section to shorten the distance between said bottom wall and said annular rim and whereby said first and second sections may be reassembled with the side wall of one of said sections being telescoped within the side wall of the other of said sections so that the overall height of said housing may be predetermined and the two sections may be rotated relative to each other to orient said light fixture in a predetermined direction.

4,617,617

SUBMERSIBLE TAIL LIGHT ASSEMBLY

Alton J. Cunningham, Slinger, and Brian A. Hanson, Allenton, both of Wis., assignors to Wesbar Corporation, West Bend, Wis.

Filed May 6, 1985, Ser. No. 731,047
Int. Cl.[4] F21V *29/00*
U.S. Cl. 362—267 **12 Claims**



1. A submersible tail light assembly for a boat trailer, comprising an outer housing having a wall and an open end, a lens to enclose the open end, a transparent capsule disposed in the housing and having an open end facing said wall, sealing means for sealing the open end of said capsule to said wall, a bulb socket disposed within the capsule, a light bulb mounted in the socket, passage means providing communication between the lower portion of the interior of said capsule and the exterior, and electrical leads connected to said bulb socket for supplying electrical power to said bulb, submerging the light assembly in water causing said water to enter the capsule through said passage means to entrap air in the upper end of the capsule and prevent the water from rising to the level of said socket and bulb.

4,617,618

HEADLAMP REFLECTORS FOR AUTOMOBILE VEHICLES MANUFACTURED BY INJECTION MOLDING ACCORDING TO THE COINJECTION PROCESS USING POLY(ALKYLENE TEREPHTHALATE)

Antoine Baciu, Anbevoye, France; Hans Jadamus, and Josef Bittscheidt, both of Marl, Fed. Rep. of Germany, assignors to Cibie Projecteurs, France and Chemische Werke Huls Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 2, 1984, Ser. No. 585,786
Claims priority, application France, Mar. 7, 1983, 83 03684
Int. Cl.[4] F21V *7/00*
U.S. Cl. 362—341 **4 Claims**

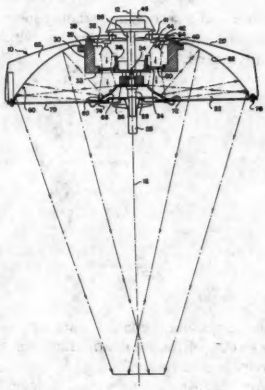
1. Headlamp reflector for an automobile vehicle manufactured by injection molding by the process of coinjection of polyalkylene terephthalate with a viscosity number of between 60 and 180 cm^3/g, in which the core comprises from 15 to 75% by weight of hematite, at least 75% of the hematite having a particle size less than 70 μm.

4,617,619

REFLECTOR FOR MULTIPLE SOURCE LIGHTING FIXTURE

Joel C. Gehly, McKean, Pa., assignor to American Sterilizer Company, Erie, Pa.

Filed Oct. 2, 1985, Ser. No. 783,379
Int. Cl.[4] A61G *13/00*; F21V *33/00*
U.S. Cl. 362—804 **11 Claims**



1. In a lighting fixture having a plurality of light source means for emitting light rays and at least one reflector, said one reflector superposing said plurality of light source means in a partially circumscribing radially spaced relationship about the axis of symmetry of said lighting fixture to receive light rays and to project light rays, an improvement comprising:

a second reflector in axial alignment with the axis of symmetry of said lighting fixture, said second reflector being positioned beneath said plurality of light source means and being superposed and partially circumscribed by said one reflector;

said second reflector having a plurality of distinct surface sections, each said surface section being associated with a different one of said light source means for receiving light rays emitted from the one said light source means with which said surface section is associated and projecting light rays onto said one reflector, each said surface section having at least two radially adjacent portions, one said portion having a surface finished for diffusing the light rays projected therefrom and the other said portion having a surface finished for intensifying the light rays projected therefrom; and

said second reflector being mounted for rotation about the axis of symmetry of said lighting fixture to selectively position either said diffusing portion or said intensifying portion of said surface sections beneath each said light source means to permit selective adjustment of the pattern and intensity of light rays projected from said lighting fixture.

4,617,620

DC TO DC CONVERTER WITH SELF-STARTING FLYBACK OSCILLATOR

Donald Speranza, Canton, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 14, 1982, Ser. No. 388,350
Int. Cl.[4] H02M *3/338*
U.S. Cl. 363—19 **6 Claims**

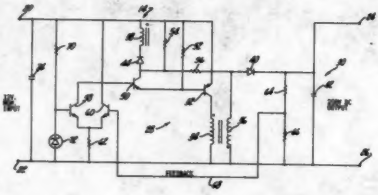
1. A DC to DC converter circuit for producing a regulated DC output voltage from an unregulated supply comprising:

a flyback oscillator including a transistor having an output

circuit connectable across the unregulated supply to periodically conduct current therefrom;

output circuit means;

transformer means for coupling the output circuit of said oscillator transistor to the output circuit means for receiving and storing eletrical energy therefrom during the interval between said conductivity periods and in amounts which vary with the conductivity period of the oscillator transistor, said transformer means comprising a primary winding in series with the output circuit of the oscillator transistor and a secondary winding in said output circuit means, said primary and secondary windings being magnetically linked;



a variable impedance control transistor connected to the input circuit of the oscillator transistor to vary the conductivity period thereof;

means for establishing a reference voltage;

comparator means connected between the output circuit means, the reference means, and the input circuit of the control transistor to vary the conductivity period according to the energy stored in the output circuit means; and

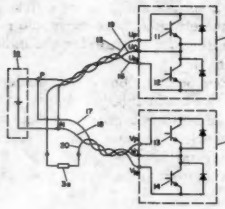
feedback means connected in series with the secondary winding and the output circuit of the control transistor to provide, when connected across said supply, a starting current path for said oscillator transistor.

4,617,621

INVERTERS WITH REDUCED DISTRIBUTED INDUCTANCE

Kazuo Kuroki, Tokyo, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Feb. 4, 1985, Ser. No. 697,779
Int. Cl.[4] H02M *7/00*; H02H *7/122*
U.S. Cl. 363—71 **2 Claims**



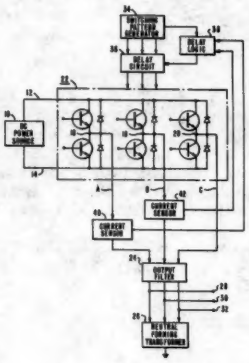
1. An inverter comprising DC power source means, load means, a plurality of inverter units arranged to operate on a phase basis, first conductor means including a pair of conductors for connecting each phase inverter unit to the power source means, and second conductor means including a conductor for connecting each phase inverter unit to the load means, wherein the conductors of the first and second conductor means for each inverter unit are arranged in close proximity from the inverter unit to a location adjacent to the power source means or the load means.

4,617,622

SWITCHING TIME CORRECTION CIRCUIT FOR ELECTRONIC INVERTERS

David A. Fox, Lima, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 27, 1985, Ser. No. 749,359
Int. Cl.[4] H02P *13/20*
U.S. Cl. 363—98 **10 Claims**



1. A switching time correction circuit comprising:

a switching circuit for alternately switching a power pole between first and second voltage levels, said switching circuit being responsive to a reference signal having a plurality of voltage transition points;

means for delaying the application of said reference signal transition points to said switching circuit, by a predetermined delay time; and

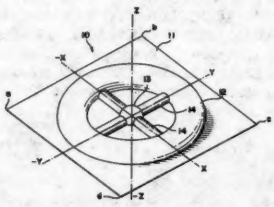
means for reducing said delay time for transition points in said reference signal which correspond to negative power transitions in said switching circuit, wherein the amount of delay time reduction is proportional to the output current of said switching circuit.

4,617,623

CNC PROCESS FOR DISPLACING A MOVABLE MEMBER ALONG A PATH ON A 3D SURFACE

Kiyoshi Inoue, Tokyo, and Jinzo Yabe, Yokohama, both of Japan, assignors to Inoue-Japax Research Incorporated, Kanagawa, Japan

Continuation of Ser. No. 434,336, Oct. 14, 1982, abandoned.
This application Jun. 7, 1985, Ser. No. 742,366
Claims priority, application Japan, Oct. 16, 1981, 56-166159
Int. Cl.[4] G06F *15/00*
U.S. Cl. 364—167 **8 Claims**



1. A computerized numerical control process for displacing a member along a path on a predetermined intricate surface in a predetermined three-dimensional coordinate system, said process comprising the steps of:

(a) manually dividing said intricate surface into a plurality of elementary characteristic regions each of which is individually definable as one of preselected different geometrical categories among curves of first order, curves of second order, surfaces of first order for intricate surfaces so divisible and surfaces of second order for intricate surfaces so divisible and is expressable by an equation specific to each such region;

(b) establishing a general equation for each of said preselected geometrical categories and storing the established general equations in memory means for a computer;

(c) inputting into said computer data required to adapt each of said stored general equations to a corresponding one of said characteristic regions in said predetermined three-dimensional coordinate system, thereby reducing it to said specific equation;

(d) establishing a sequence of incremental two-dimensional positions in said three-dimensional coordinate system which positions are defined by predetermined first and second coordinates thereof;

(e) successively inputting into said computer the coordinates of said sequentially incremental two-dimensional positions to compute, for each incremental position along a path lying on said surface, the value of a third coordinate in said coordinate system from said specific equations and said inputted first and second coordinates, thereby determining said path three-dimensionally; and

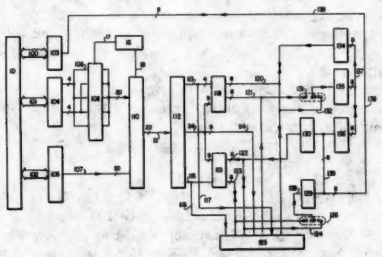
(f) displacing said member along the so determined path.

4,617,624

MULTIPLE CONFIGURATION MEMORY CIRCUIT

James B. Goodman, 9600 Golf Lakes Trail, Apt. 2010, Dallas, Tex. 75231

Filed Apr. 16, 1984, Ser. No. 600,371
Int. Cl.[4] G06F *12/00, 13/00*
U.S. Cl. 364—200 **16 Claims**



1. A memory apparatus for connection to a central processing unit and to an information bus for transfer of data, addresses and control signals, said memory apparatus comprising:

a memory circuit for retaining a plurality of data words, each data word having a unique address within an address space; and

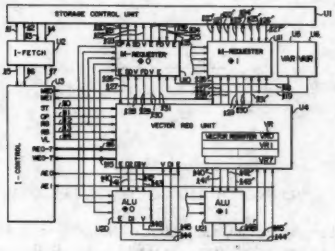
control means connected to said bus for obtaining one data word from or providing one data word to said memory circuit in response to an address within a first set of addresses and in response to a first set of control signals, and for obtaining at least one data word from or providing at least one data word to said memory circuit in response to a second set of control signals and in response to an address within a second set of addresses, said second set being the address space except for the first set of addresses.

4,617,625

VECTOR PROCESSOR

Shigeo Nagashima, Hachioji; Hitoshi Abe, and Yasuhiko Hatakeyama, both of Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 27, 1982, Ser. No. 453,094
Claims priority, application Japan, Dec. 28, 1981, 56-210392
Int. Cl.[4] G06F *7/48*
U.S. Cl. 364—200 **79 Claims**



1. A vector data processor comprising:

a main storage;

vector storage means connected to receive vector elements from said main storage and including a plurality of storage area for holding a plurality of vector elements, each storage area being selected by an instruction, being capable of holding a number of vector elements and being capable of reading and writing in parallel;

a plurality of resource means connected to said storage means each for sequentially receiving vector elements from said vector storage means and/or for sequentially providing vector elements to said vector storage means, including, as one of said plurality of resource means, at least one operation means connected to said vector storage means for performing an operation on inputs provided sequentially to said operation means from said vector storage means in such a manner as to provide sequential outputs corresponding to the results of said operation to said vector storage means;

instruction means connected to said main storage for decoding instructions fetched from said main storage, for selecting one of said plurality of resource means required by each instruction and for indicating the start of execution for the decoded instructions, said instruction means including means for indicating, irrespective of execution start indication timing of a previously-execution-started first instruction, the execution start of a second instruction which selects the same storage area of said vector storage means for reading of vector elements therefrom as one selected by said first instruction for writing of vector elements therein;

control means connected to said instruction means and said plurality of resource means and responsive to indication of start of execution of a decoded instruction for sequentially reading vector elements out of one of the storage areas of said vector storage means selected by said decoded instruction to provide the read out vector elemtns to one of said plurality of resource means selected for said decoded instruction to be received thereby and/or for sequentially writing vector elements provided from the resource means selected for the decoded instruction into one of the storage areas of said vector storage means selected by said decoded instruction, said control means being capable of responding to the indication of start of execution of the second instruction given by said instruction means before completion of writing of vector elements provided from the first resource means selected for the first instruction into said same selected storage area performed in response to the indication of start of execution of the first instruc-

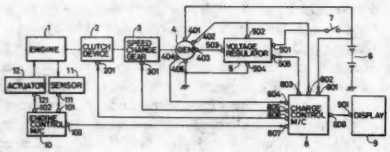
tion, and being capable of starting the sequential reading of the written vector elements out of said same selected storage area from before all the vector elements are written by controlling a read operation of each vector element depending upon whether or not each vector element is already written when each vector element is to be read next, to sequentially provide the read out vector elements to a second one of said plurality of resource means selected for said second instruction.

4,617,626

CHARGE CONTROL MICROCOMPUTER DEVICE FOR VEHICLES

Mitsuharu Morishita, and Shinichi Kouge, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 19, 1983, Ser. No. 496,034
Claims priority, application Japan, May 19, 1982, 57-86061
Int. Cl.[4] H02J 7/14; G06F 15/56
U.S. Cl. 364—424 **4 Claims**



1. A charge control microcomputer device for a vehicle, comprising:

speed changing means for transmitting the output torque of an engine, said speed changing means including slip clutch means having an output with a variable slippage amount with respect to its input and controlled in accordance with an operating instruction, said speed changing means further including a speed change gear for changing the rotational speed input thereto at an output thereof, said speed change gear receiving the output of said slip clutch means;

a charging generator driven by the output of said speed change gear;

a battery charged by an output voltage of said charging generator;

a voltage regulator for controlling the output voltage of said charging generator to a predetermined value;

an engine controlling microcomputer for receiving data from said engine, to control said engine, said engine data comprising at least an engine speed signal;

a charge control microcomputer for processing engine data from said engine controlling microcomputer and charge system data including terminal voltage data from said battery and generated voltage data from said changing generator, to provide a reference voltage from said voltage regulator, for detecting charging system faults according to said charge system data, and for processing an engine speed signal to apply said operating instruction to said speed changing means, so that said charging generator is driven with a predetermined range of revolutions per minute at all times; and

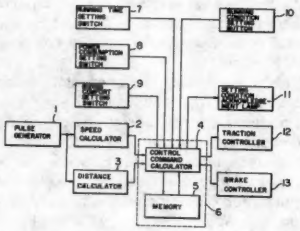
a display unit for displaying detection data, including fault detection data, from said charge control microcomputer.

4,617,627

METHOD FOR AUTOMATIC OPERATION OF A VEHICLE

Seiji Yasunobu, Yokohama; Shoji Miyamoto, Kawasaki, and Hirokazu Ihara, Machida, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 13, 1984, Ser. No. 570,500
Claims priority, application Japan, Jan. 17, 1983, 58-5641; Jun. 9, 1983, 58-103487
Int. Cl.[4] G06F 15/48; B60L 15/20
U.S. Cl. 364—426 **25 Claims**



1. A method for automatic operation of a vehicle in which a vehicle is automatically controlled in accordance with control commands for operating a traction controller and a brake controller of the vehicle in order to run with required speed patterns through a plurality of regions into which a distance between two stations is divided, comprising the steps of:

preparing a table representative of a relation between a plurality of region control patterns for vehicle control, each of which designates control commands which are applied to the respective regions, and a plurality of performance index patterns relating to a plurality of predetermined performance indices reflecting the result of running of the vehicle when the vehicle is controlled in accordance with said region control patterns;

designating a performance index pattern for running of the vehicle from one station to the next station before the vehicle departs from the one station;

determining a region control pattern corresponding to said designated performance index pattern on the basis of said table; and

applying the control commands in accordance with said determined region control pattern to the vehicle speed control to run the vehicle.

4,617,628

EXPANDABLE ELECTROSTATIC ENGINE DIAGNOSTICS CLASSIFIER

Philip E. Zwicke, South Glastonbury; David M. Rosenbush, Granby, both of Conn., and Robert P. Couch, Palm Beach Gardens, Fla., assignors to United Technologies Corporation, Hartford, Conn.

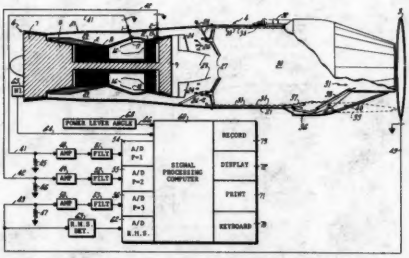
Filed Dec. 28, 1982, Ser. No. 453,963
Int. Cl.[4] G01M 15/00
U.S. Cl. 364—431.02 **2 Claims**

1. Electrostatic diagnostic apparatus for distinctly correlating different events occurring in an operating gas turbine engine, comprising:

electrostatic signal means, including a probe to be disposed in the gas stream of an engine, for providing, when said probe is disposed in the gas stream of an operating engine, a probe signal having a waveshape defined by amplitude variations thereof across a time interval of a given duration in response to electrostatic charge flowing in the gas stream in the vicinity of said probe; and

signal processing means connected for response to said electrostatic signal means, for selectively providing a particular engine event identifying signal selected, in response to

said amplitude variations across said time interval, from among a plurality of identifying signals in dependence on the waveshape of said probe signal having characteristics correlated to an engine event corresponding to said selected identfying signal, and for selectively providing a particular unidentified category signal in dependence on the waveshape of said probe signal having characteristics correlated to an unidentified engine event.

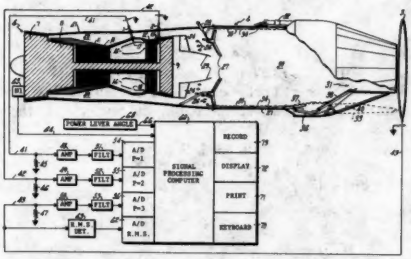


4,617,629

EXPANDED CLASSIFICATION SAMPLE IN ELECTROSTATIC ENGINE DIAGNOSTICS

Robert P. Couch, Palm Beach Gardens, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 28, 1982, Ser. No. 453,967
Int. Cl.[4] G01M *15/00*
U.S. Cl. 364—431.02 **4 Claims**



1. Electrostatic diagnostic apparatus for distinctly correlating different events occurring in an operating gas turbine engine, comprising:

elecgrostatic signal means, including a probe to be disposed in the gas stream of an engine, for providing, when said probe is disposed in the gas stream of an operating engine, a probe signal having a waveshape defined by amplitude variations thereof across a time interval of a given duration in response to electrostatic charge flowing in the gas stream in the vicinity of said probe;

an analog to digital converter connected for response to said electrostatic signal means; and

signal processing means connected to said analog to digital converter

(a) for causing said analog to digital converter to sample the probe signal provided by said electrostatic signal means in a manner to provide a record of digital signals indicative of the amplitude variations of said probe signal defining the waveshape thereof,

(b) for storing, in response to the amplitude of one of said digital signals being in excess of a threshold magnitude, a record comprising a contiguous sequence of said digital signals sufficient to define the waveshape of said probe signal, repetiively, to provide a first classification group consisting of a given number, M, of records, and

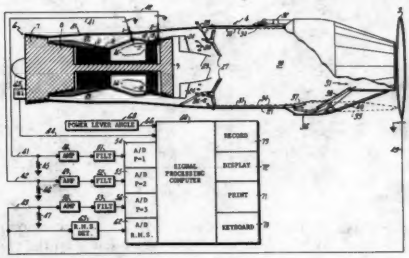
(c) for selectively providing for each of said records, a particular engine event identifying signal selected, in response to variations in amplitude of the digital signals in said record, from among a plurality of identifying signals in dependence upon the waveshape of signals represented by each of said records having characteristics correlated to an engine event corresponding to said particular identifying signal.

4,617,630

SYSTEM FAULT DISCRIMINATING ELECTROSTATIC ENGINE DIAGNOSTICS

Philip E. Zwicke, South Glastonbury; David M. Rosenbush, Granby, both of Conn., and Robert P. Couch, Palm Beach Gardens, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 28, 1982, Ser. No. 454,111
Int. Cl.[4] G01M *15/00*
U.S. Cl. 364—431.02 **3 Claims**



1. Electrostatic diagnostic apparatus for distinctly correlating different events occurring in an operating gas turbine engine, comprising:

electrostatic signal means, including a probe to be disposed in the gas stream of an engine, for providing, when said probe is disposed in the gas stream of an operating engine, a probe signal having a waveshape defined by amplitude variations thereof across a time interval of a given duration in response to electrostatic charge flowing in the gas stream in the vicinity of said probe; and

signal processing means connected for response to said electrostatic signal means, for selectively providing a particular engine event identifying signal selected, in response to said amplitude variations across said time interval, from among a plurality of identifying signals in dependence on the waveshape of said probe signal having characteristics correlated to an engine event corresponding to said selected identifying signal, and for providing a diagnostic apparatus fault identifying signal in response to said amplitude variations across said time interval in dependence on the waveshape of said probe signal having characteristics correlated to a faulty condition in said electrostatic signal means.

4,617,631

EXTERNALLY DISCRIMINATED/CORRELATED ELECTROSTATIC ENGINE DIAGNOSTICS

David M. Rosenbush, Granby; Philip E. Zwicke, South Glastonbury, both of Conn., and Robert P. Couch, Palm Beach Gardens, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 28, 1982, Ser. No. 454,114
Int. Cl.[4] G01M *15/00*
U.S. Cl. 364—431.02 **4 Claims**

1. Electrostatic diagnostic apparatus for distinctly correlat-

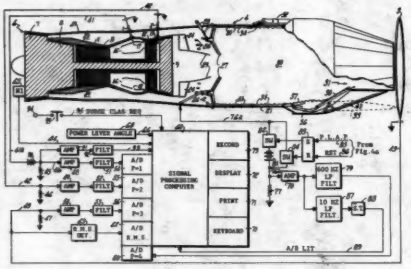
ing different events occurring in an operating gas turbine engine, comprising:

electrostatic signal means, including a probe to be disposed in the gas stream of an engine, for providing, when said probe is disposed in the gas stream of an operating engine, a probe signal having a waveshape defined by amplitude variations thereof across a time interval of a given duration in response to electrostatic charge flowing in the gas stream in the vicinity of said probe;

means connected for response to an operating condition of said engine to provide a condition signal indicative thereof;

signal processing means connected for response to said electrostatic signal means,

(a) for selectively providing a particular engine event identifying signal selected, in response to said amplitude variations across said time interval, from among a plu-



rality of identifying signals related to a corresponding plurality of engine events, in dependence on the waveshape of said probe signal having characteristics correlated to an engine event corresponding to said selected identifying signal,

(b) for providing a discrete signal indicative of a specific engine event in response to said condition signal, said specific engine event being included among said plurality of engine events along with said particular engine event,

(c) for providing a category signal indicative of an engine event identified by both said particular identifying signal and said discrete signal, and

(d) for alternatively providing a different category signal in the case that said particular engine event identifying signal is not correlated to the engine event identified by said discrete signal.

4,617,632

WAVEFORM DISCRIMINATED ELECTROSTATIC ENGINE DIAGNOSTICS

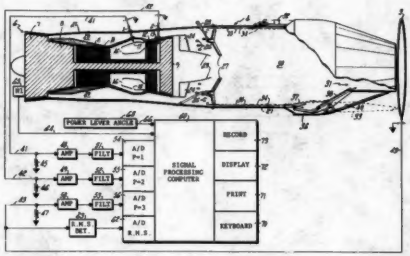
Philip E. Zwicke, South Glastonbury; David M. Rosenbush, Granby, both of Conn., and Robert P. Couch, Palm Beach Gardens, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 28, 1982, Ser. No. 454,124
Int. Cl.[4] G01M *15/00*
U.S. Cl. 364—431.02 **4 Claims**

1. Electrostatic diagnostic apparatus for distinctly correlating different events occurring in an operating gas turbine engine, comprising:

electrostatic signal means, including a probe to be disposed in the gas stream of an engine, for providing, when said probe is disposed in the gas stream of an operating engine, a probe signal having a waveshape defined by amplitude variations thereof across a time interval of a given duration in response to electrostatic charge flowing in the gas stream in the vicinity of said probe; and

signal processing means connected for response to said electrostatic signal means, for selectively providing a particular engine event identifying signal selected, in response to said amplitude variations across said time interval, from



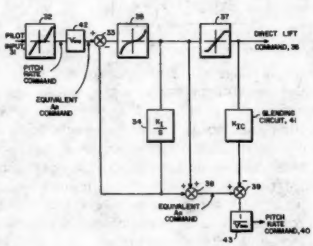
among a plurality of identifying signals in dependence on the waveshape of said probe signal having characteristics correlated to an engine event corresponding to said particular identifying signal.

4,617,633

DIRECT LIFT COMMAND BLENDING

Jack D. McAllister, Fort Worth, Tex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 29, 1984, Ser. No. 614,904
Int. Cl.[4] B64C *15/00*
U.S. Cl. 364—434 **5 Claims**



1. An aircraft flight control corcuit receiving a system command signal and generating direct lift and longitudinal command signals, said flight control circuit comprising:

a direct lift command signal circuit receiving said system command signal and developing a direct lift command signal as a function thereof,

subtraction means differencing said system command signal and said direct lift command signal to provide a longitudinal command signal,

and a blending circuit, said blending circuit constraining said longitudinal comman signal as a function of said direct lift command signal.

4,617,634
ARTIFICIAL SATELLITE ATTITUDE CONTROL SYSTEM

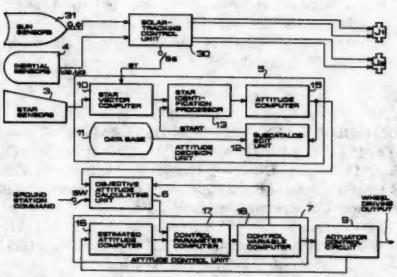
Kiichiro Izumida, and Ritaroh Kasai, both of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 3, 1984, Ser. No. 606,660

Claims priority, application Japan, Jun. 28, 1983, 58-116372; Jun. 30, 1983, 58-118708

Int. Cl.[4] B64G *1/36, 1/28*

U.S. Cl. 364—455 **7 Claims**



1. A system for controlling an artificial attitude of a satellite and changing rate thereof on the basis of detected signals from inertial sensors for detecting angular velocities of rotation of the satellite about the body axes thereof and star sensors for detecting incident light from fixed stars so as to coincide with an objective attitude, comprising:

a first means for deciding the present attitude of the satellite with respect to said body axes on the basis of said signals from said sensors to provide positional information for indicating present position of the satellite;

a second means for deciding an objective attitude of the satellite to be established, on the basis of orbit information received from a ground station and said positional information to provide an objective attitude information indicating the objective attitude;

a third means for calculating required operation values for controlling the attitude on the basis of said objective attitude information, said values being fed to actuators for controlling the attitude of the satellite;

said first means including:

means to calculate a unit vector representing the direction of an observed fixed star on the body coordinate of the satellite, on the basis of the detected signals from said star sensors;

memory means for storing an initial estimated attitude information of the satellite and catalog information representing the spatial coordinates of fixed stars;

edit means for reading the attitude information and catalog information from the memory means to edit a catalog of stars expected to be observed within the ranges of the field of view of the star sensors;

means for identifying a catalog star corresponding to the observed fixed star, on the basis of said unit vector and said catalog; and

means for calculating the present attitude of the satellite on the basis of said catalog star from said identifying means and the detected signals from the inertial sensor to provide the information of the present attitude of the satellite.

4,617,635
NUMERICAL CONTROL MACHINING SYSTEM

Yutaka Shimizu, Aichi, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

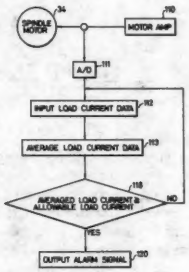
PCT No. PCT/JP83/00010, § 371 Date Dec. 19, 1983, § 102(e) Date Sep. 9, 1983, PCT Pub. No. WO83/02416, PCT Pub. Date Jul. 21, 1983

PCT Filed Jan. 11, 1983, Ser. No. 537,455

Claims priority, application Japan, Jan. 12, 1982, 57-3149; Jan. 12, 1982, 57-3150; Jan. 20, 1982, 57-7232; Dec. 2, 1982, 57-211975

Int. Cl.[4] G05B *19/00*

U.S. Cl. 364—474 **21 Claims**



1. A numerical control machining system of the type including a spindle motor for rotating the spindle of a machining apparatus to which a tool is connected, a feed motor means for moving the table of said machining apparatus to which a workpiece is fixedly secured, and a numerical control device for controlling the speed of rotation of said spindle motor and the feed speed of said table, so that said workpiece is machined with said tool, characterized in that:

said system further comprises detection means for detecting a machining load current of said spindle motor and sampling means for sampling said load current thus detected periodically at predetermined time intervals to provide an input to said numerical control device, and

said numerical control device comprises means for averaging a predetermined number of load current data to obtain a load output of said spindle motor, means for comparing said load output with an allowable load output of said spindle motor which has been calculated in advance, and control means for controlling the feed speed of said feed motor means in accordance with said comparison.

4,617,636
PROTECTION OF ELECTRICAL POWER SUPPLY SYSTEMS

Allan T. Johns, Corsham, and Michael A. Martin, Bradford-on-Avon, both of England, assignors to National Research Development Corporation, London, England

Filed Mar. 2, 1983, Ser. No. 471,333

Claims priority, application United Kingdom, Mar. 3, 1982, 8206253

Int. Cl.[4] G01R *31/08, 27/08;* H02H *3/42*

U.S. Cl. 364—482 **5 Claims**

1. Apparatus for detecting the occurrence of a fault in a section of an electrical power supply system comprising:

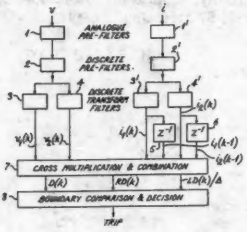
means for measuring the values of the voltage and current at a predetermined location to develop measured voltage and current representations,

means for filtering out high frequency components in the measured voltage and current representations,

means for calculating an approximation to the Fourier transform of a moving window of the filtered voltage representation over a predetermined interval of time and at a

predetermined frequency, said Fourier transform of the voltage representation being modified by a continuous phase change at the said frequency,

means for calculating an approximation to the Fourier transform of a moving window of the filtered current representation over the said time interval and at the said frequency, said Fourier transform of the current representation being



modified by a continuous phase change at the said frequency,

means for calculating the impedance of said section from said modified Fourier transforms of the voltage and current representations, and

means for generating a trip signal when the value of said calculated impedance indicates a fault.

4,617,637

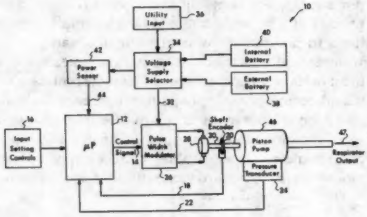
SERVO CONTROL SYSTEM FOR A RECIPROCATING PISTON RESPIRATOR

Raymond D. Chu, Boulder; Anthony C. Rubner, Arvada, and Michael W. Fellinger, Boulder, all of Colo., assignors to Life-care Services, Inc., Boulder, Colo.

Filed Jul. 9, 1985, Ser. No. 753,275

Int. Cl.[4] G06F *15/20;* **F04B** *35/04;* **A61M** *16/00*

U.S. Cl. 364—505 **11 Claims**



1. A system for generating predetermined flow characteristics in a reciprocating piston respirator by controlling movement of a piston comprising:

detector means for generating a detected position signal indicative of a current actual position of said piston in said reciprocating piston respirator;

analysis means for using nonlinear, predictive servo control techniques employing said detected position signal to generate a control signal representative of a force sufficient to move said piston in said reciprocating piston respirator to a stored next position to produce said predetermined flow characteristics comprising:

logic means for using said nonlinear, predictive servo control techniques for performing time domain analysis of fictional, pressure and inertial factors affecting movement of said piston to predict said force required to move said piston to said next position through the use of program control means for generating position data representative of a plurality of position values which said piston must assume at a plurality of substantially equally spaced segment times to produce said predetermined flow characteristics;

means for generating said force sufficient to move said piston in said reciprocating piston respirator in response to said control signal comprising:

pulse-width modulation means for producing a digital representation of a required power signal which is substantially proportional to said force;

direction selection means for producing a digital direction signal which substantially represents a direction of motor rotation;

buffer means for converting said digital representation of said required power signal and said digital direction signal into a polarized electrical power signal which is substantially proportional to said force;

motor means for converting said polarized electrical power signal into rotational power; and,

piston displacement means for converting said rotational power into lateral movement of said piston.

4,617,638

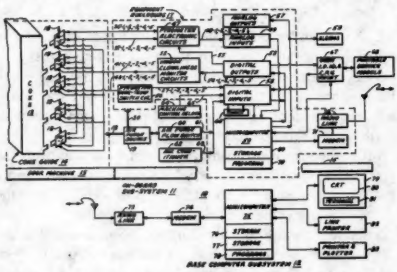
METHOD AND SYSTEM FOR DETERMINING MASS TEMPERATURE IN A HOSTILE ENVIRONMENT

Richard H. Krause, Lansdale; Thomas J. Pfeiffer, and Vincent V. Horvath, both of Bethlehem, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Continuation-in-part of Ser. No. 328,775, Dec. 8, 1981, abandoned. This application Jun. 1, 1984, Ser. No. 616,520

Int. Cl.[4] H03K *13/02;* **G01K** *7/12*

U.S. Cl. 364—557 **10 Claims**



1. A system for determining temperature as an irradiant mass movable through process means located in a hostile environment, comprising:

(a) means for measuring irradiant mass temperature with a sensor aimed at said mass through a sighting window and adjacent sighting space and producing a mass temperature signal, said signal varying proportional to mass temperature and an optical error caused by environmental matter affecting the sighting window and possibly said space;

(b) means for monitoring sighting window and space for cleanliness with a monitor light source which passes monitor light through the sighting space and window and into the sensor;

(c) means for generating a monitor light control signal to turn said light on and off respectively before mass movement starts through the process means:

(d) computer means for detecting the optical error portion of the mass temperature signal by comparing actual sensor response to the monitor light source with the signal obtained from said light source for a clean window:

(e) computer means for processing the detected optical error data to obtain and store a correction factor based on first and second sensor measurements made in response to the monitor on-off control signal, respectively, said correc-

tion factor used to produce a corrected mass temperature data;

(f) means for generating a digital timing signal related to mass movement; and

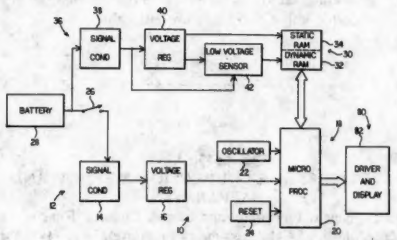
(g) means for displaying in synchronization with the digital timing signal a sequence of the first sensor temperature data uncorrected, followed by the second and subsequent sensor temperature data as corrected mass temperature measured during mass movement.

4,617,639

HOUR METER APPARATUS AND METHOD

John C. Paine, Chardon, Ohio, assignor to Caterpillar Industrial Inc., Mentor, Ohio

Filed Aug. 8, 1984, Ser. No. 638,913
Int. Cl.[4] G06F *15/20*; G08B *19/00*; B60Q *1/00*
U.S. Cl. 364—569 **14 Claims**



1. Apparatus for measuring, storing and displaying the accumulated period of time an intermittent operating condition of a vehicle exists, comprising:

means for detecting said intermittent operating condition and producing a control signal in response to said detected condition;

oscillator means for producing a predetermined clock frequency signal;

a dynamic memory device having a plurality of addressable memory locations;

a non-volatile memory device having a plurality of addressable memory locations;

a plurality of time interval registers; and,

processor means for receiving said control signal and said clock frequency signal, controllably modifying predetermined ones of said plurality of time interval registers in response to receiving both said control signal and a predetermined number of cycles of said clock frequency signal, storing a representation of the contents of said time interval registers in said dynamic memory device in response to each modification of a first predetermined one of said time interval registers, and transferring the contents of said dynamic memory device to said non-volatile memory device in response to each modification of a second predetermined one of said time interval registers.

4,617,640

PORTABLE AUTOMATIC NC PROGRAMMING DEVICE

Hajimu Kishi, Hino; Tadayoshi Onuki, Sagamihara, and Mitsuo Kurakake, Hino, all of Japan, assignors to Fanuc Ltd., Tokyo, Japan

Filed Mar. 24, 1983, Ser. No. 478,225
Claims priority, application Japan, Mar. 24, 1982, 57-45530
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—708 **1 Claim**

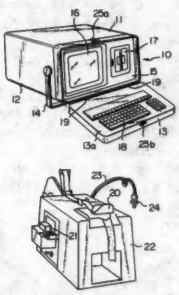
1. A portable programming device comprising:

a box like casing including a body having an open side, a lid element hinged along one of its side edges to said body along a side edge of said open side to cover said open side when said lid element is hinged clowed and to expose said open side when said lid element is hinged open, and a carrying handle attached to said body, said body of said box like casing being substantially formed in the shape of a rectangular parallelpiped and said lid element being formed in the shape of a rectangular plate;

a graphic display unit encased in said body on said open side and exposed for display when said lid element is hinged open;

a floppy deck encased in said body juxtaposed side by side within said rectangular parallelpiped box with said graphic display unit; and

a keyboard panel arranged inside of said lid element;



said device being ready for programming when said lid element is hinged open on said body;

said carrying handle being pivotally attached at its opposite ends to opposite sides of said body adjacent to said open side and said lid element;

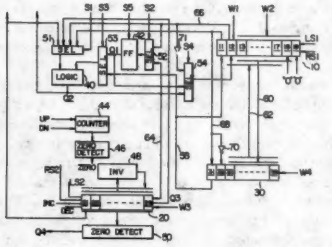
said handle, when said lid element is hinged open on said body and said device is ready for programming, supporting said open side of said body with said graphic display unit and said floppy deck tipped backward, and said open lid element with said keyboard panel arranged inside thereof tipped forward, from said hinge of said lid element to said rectangular parallelpiped box.

4,617,641

OPERATION UNIT FOR FLOATING POINT DATA HAVING A VARIABLE LENGTH EXPONENT PART

Hozumi Hamada, Chofu, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 19, 1983, Ser. No. 543,426
Int. Cl.[4] G06F *7/48, 5/00*
U.S. Cl. 364—748 **15 Claims**



7. An operation unit for floating point data comprised of a variable-length exponent part indicative of an exponent of a number and a variable-length mantissa part indicative of a mantissa of the number, the exponent part including a preceding first bit portion of all "1" or all "0" and a succeeding

second bit portion indicative of a value of the exponent of the number, the bit length of the preceding first bit portion depending upon a value of the exponent of the number, the bit length of the succeeding second bit portion depending upon the bit length of the preceding first bit portion, comprising:

first means for responding to all 1 or all 0 included in the preceding first bit portion of the exponent part of the floating point data and for separating the succeeding second bit portion of exponent part and the mantissa part based upon the bit length of the all 1 or all 0 part of the preceding first bit portion; and

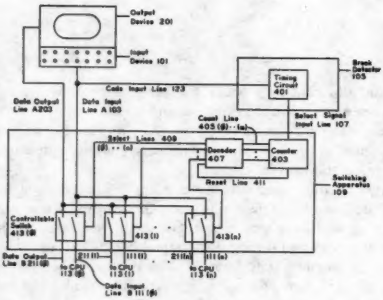
second means connected to said first means for performing an arithmetic operation on the separated succeeding second bit portion of the exponent part and the separated mantissa part.

4,617,642

SELECT SWITCH RESPONSIVE TO A BREAK CODE

Jeffrey S. Clark, Raleigh, N.C., assignor to Data General Corporation, Westboro, Mass.

Filed May 6, 1982, Ser. No. 375,245
Int. Cl.[4] G06F *7/00*; H04Q *9/00*
U.S. Cl. 364—900 **4 Claims**



1. In electrical apparatus including

(1) a first component having means for generating digital codes, said digital codes consisting of sequences of states including a first state and a second state and including

(a) transmission codes having a uniform length and consisting of at least one first state and at least one second state, and

(b) break codes consisting only of said second state and having a length equal to said uniform length, and

(2) a plurality of other components,

selection means responsive to said break codes for electrically connecting said first component with a selected one of said plurality of other components, said selection means comprising:

(1) means, connected to said means for generating digital codes, for detecting said break codes in said digital codes, said break code detection means including means for determining the length of each said sequence of consecutive second states and means for generating a select signal on each occurrence of a sequence of said second states which is at least equal to said uniform length; and

(2) switching means responsive to said select signal for electrically connecting said first component with a selected one of said other components, said switching means including:

(a) a plurality of controllable switching means, each one of said plurality of controllable switching means being associated with and connected to a corresponding component of said plurality of other components,

(b) a plurality of select lines, each one of said select lines being associated with and connected to a corresponding one of said controllable switch means,

(c) resettable counting means connected to said break code detector, to a reset line, and to a plurality of count lines, said resettable counting means including means for incrementing an encoded value in response to said select signal, means for outputting said encoded value on said plurality of count lines, and means for responding to one said reset signal by resetting said encoded value to a preset value, and

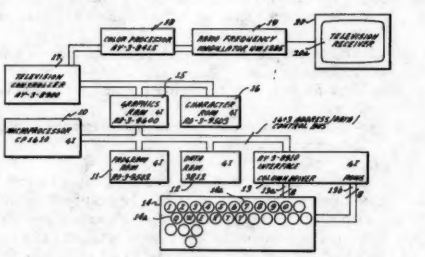
(d) decoding means connected to said plurality of count lines, to said plurality of select lines, and to said reset line and responsive to said encoded value, said decoding means including means for providing a signal to the one select line corresponding to said encoded value, means for removing the signal from the one select line corresponding to the previous encoded value, and means for providing said reset signal on said reset line when said encoded value exceeds a present value.

4,617,643

SYNTAX ERROR CORRECTION METHOD AND APPARATUS

Anita H. Klock, Lawndale, and Jan B. Chodak, Rancho Palos Verdes, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Oct. 29, 1982, Ser. No. 437,787
Int. Cl.[4] G06F *11/32*
U.S. Cl. 364—900 **8 Claims**



1. For use in a digital computer in which a series of programming statements are processed, and in which the structure of programming statements must conform to a predetermined set of syntax criteria to permit processing, a method of syntax examination and correction comprising the steps of:

compiling a programming statement in response to user input;

displaying said programming statement;

examining the structure of said statement in accordance with a predetermined set of syntax rules;

displaying selected color indicia of each character within said statement which is in accordance with said predetermined set of syntax rules;

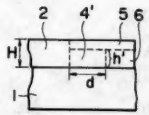
determining whether any characters remain to which color indicia have not been assigned;

examining the color indicia bearing characters alone in accordance with said set of syntax rules and designating said statement as acceptable or unacceptable, and, if designated acceptable, entering an altered programming statement thereof into the program formed solely of color indicia bearing characters.

4,617,644
HIGH-DENSITY MAGNETIC BUBBLE MEMORY DEVICE

Minoru Hiroshima; Shinzo Matsumoto; Mitsuru Sekino, and Yoshinori Taniguchi, all of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 19, 1984, Ser. No. 590,869
Claims priority, application Japan, Mar. 22, 1983, 58-45936
Int. Cl.[4] G11C *19/08*
U.S. Cl. 365—36 11 Claims

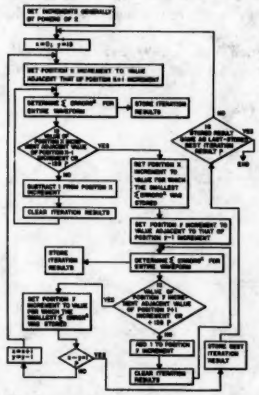


1. A magnetic bubble memory device comprising a substrate, a magnetic layer which has a thickness H including an ion implanted layer at the surface thereof and in which magnetic bubbles having a diameter d not larger than 2 μm can be sustained, and a propagation pattern for propagating the magnetic bubbles in said magnetic layer, a relation of $H/d \leqq 0.8$ being satisfied.

4,617,645
COMPACTION METHOD FOR WAVEFORM STORAGE

Richard P. Sprague, Westminster, Calif., assignor to First Byte, Long Beach, Calif.

Filed Sep. 10, 1984, Ser. No. 649,227
Int. Cl.[4] G11C *13/00, 27/00*
U.S. Cl. 365—45 10 Claims

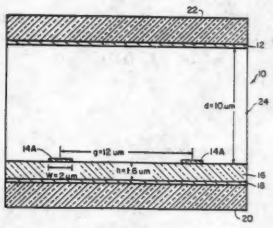


1. A method of compactly storing and retrieving a waveform, comprising the steps of:
(a) establishing a table containing a relatively small number of predetermined increments;
(b) storing a series of addresses, each address identifying one of said increments in said table;
(c) successively producing a series of samples representing generally the value of said waveform at time-spaced intervals, each of said samples corresponding to one of said addresses;
(d) predicting the value of each new sample to be produced, said predicted value being a fixed function of the values of at least a current and a previous sample;
(e) incrementing said predicted value by the increment identified by said address for said new sample, to produce a sample value at least approximating the actual value of said waveform at the sampling point; and
(f) reconstituting said waveform from said approximating samples.

4,617,646
ELECTRIC FIELD GRADIENT EXCITED LIQUID CRYSTAL CELL HAVING BISTABILITY

Kei-Hsiung Yang, Somers, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1984, Ser. No. 626,161
Int. Cl.[4] G11C *13/04*
U.S. Cl. 365—108 11 Claims

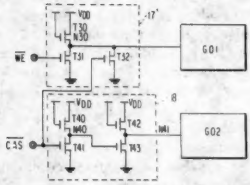


1. A liquid crystal bistable storage device comprising:
(a) a layer of liquid crystal material having at least two stable states, one of which is defined as an ordered state, the other as a disordered or scattered state;
(b) at least three separated electrodes;
(1) a first electrode of which provides a ground plane;
(2) a second electrode in a mesh-like arrangement;
(3) a third electrode in spaced relationship with said second electrode;
(c) means for selectively applying varying potential levels to each of said second and third electrodes to produce distinct electric field configurations within said layer of liquid crystal material such that said stable states of said liquid crystal layer are changed from ordered to disordered.

4,617,647
MEMORY CIRCUIT

Katsuji Hoshi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 14, 1983, Ser. No. 561,371
Claims priority, application Japan, Dec. 14, 1982, 57-218683
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—189 8 Claims



7. A memory circuit comprising, a plurality of memory cells, a column address strobe terminal for directly receiving a column address strobe signal which is externally generated outside the memory circuit, first means responsive to said column address strobe signal for operatively making said memory cells in an accessed state, a write control terminal for directly receiving a write control signal which is externally generated

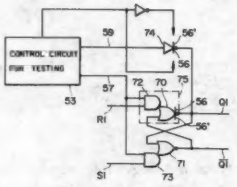
outside the memory circuit, and second means for operatively performing a write operation to the selected memory cell under the accessed state of said memory cells, said second means including a logic gate having a first input terminal directly connected to said column address strobe terminal and a second input terminal connected to said write control terminal, said logic gate generating a write execution signal for achieving a write operation only when both of said column address strobe signal and said write control signal are present.

4,617,648

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Shigeo Kuboki, Nakaminato; Hideo Maejima, and Ikuro Masuda, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 8, 1984, Ser. No. 669,348
Claims priority, application Japan, Nov. 10, 1983, 58/211355
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—189 **7 Claims**



1. A semiconductor integrated circuit device provided with a flip-flop circuit including gates which are connected to each other so as to form a closed loop, said device comprising:

first means for generating a first write timing signal, a second write timing signal, a diagnosis control signal and diagnostic data which are all concerned with said flip-flop circuit, when said semiconductor integrated circuit device is diagnosed to detect a fault therein;

second means connected to the output side of said flip-flop circuit for making and breaking the closed loop of said gates in accordance with said first write timing signal;

third means connected to the output side of said flip-flop circuit for supplying said diagnostic data to said flip-flop circuit in accordance with the second write timing signal; and

fourth means connected to the input side of said flip-flop circuit for blocking a signal applied to the input side of said flip-flop circuit, in accordance with said diagnosis control signal.

4,617,649

ERASABLE FPLA

Mikio Kyomasu; Toshiyuki Araki, both of Toyono; Shinobu Fukunaga, Kawanishi, and Masahiro Shindo, Toyonaka, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 442,167, Nov. 16, 1982, Pat. No. 4,503,520. This application Jan. 7, 1985, Ser. No. 689,703
Claims priority, application Japan, Nov. 17, 1981, 56-185037
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—189 **34 Claims**

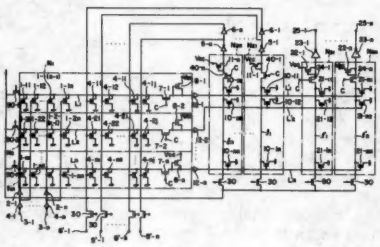
1. A programmable logic array in which a desired logic function may be erasably programmed comprising:

a plurality of input terminals;

an AND plane including a plurality of AND gates each of which is operatively connected to receive a signal from the corresponding one of said plurality of input terminals; and

an OR plane including a plurality of OR gates each of which is operatively connected to receive a signal from the corresponding one of said plurality of AND gates in said AND plane and to supply a logic output, wherein at least one of said AND and OR planes includes:

a matrix of conductors including first and second conductors which run in different directions thereby defining intersections therebetween and which are electrically isolated from one another; and



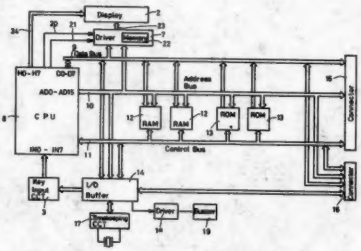
a plurality of reprogrammable memory elements each disposed at each of the intersections between said first and second conductors, each of said reprogrammable memory elements having a first electrode connected to the corresponding one of said first conductors, a second electrode connected to the corresponding one of said second conductors and a third electrode connected to a reference voltage.

4,617,650

MEMORY MODULE FOR A PROGRAMMABLE ELECTRONIC DEVICE

Masuaki Morino, Soraku, and Yuji Takada, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 1, 1983, Ser. No. 519,148
Claims priority, application Japan, Aug. 3, 1982, 57-135960
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—195 **5 Claims**



1. A memory module connectable to a programmable electronic device comprising:

input means for introducing information into said device;

means for developing a write command;

memory means, responsive to the write command developed by said means for developing, for storing said information introduced by said input means therein, said memory means including a plurality of independently addressable read/write memory areas;

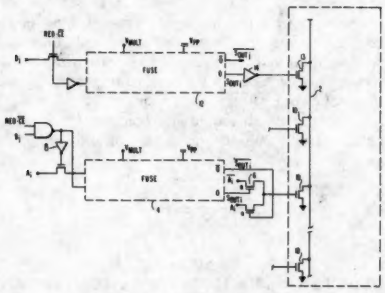
inhibit means, disposed between said means for developing and said memory means, for inhibiting the application of said write command to selected ones of said plurality of independently addressable read/write memory areas, which form less than all of said plurality of memory areas

to thereby prevent undesired damage to the contents of these inhibited memory areas.

4,617,651
REDUNDANCY CIRCUIT FOR USE IN A SEMICONDUCTOR MEMORY ARRAY

William W. Ip, San Jose, and Gust Perlegos, Fremont, both of Calif., assignors to Seeq Technology, Inc., San Jose, Calif.

Filed Feb. 22, 1984, Ser. No. 582,438
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—200 **9 Claims**



1. A circuit for use with a semiconductor memory divided into primary and redundant arrays, which circuit is capable of being programmed to enable a redundant word line in the redundant array whenever a predetermined address bit having a value associated with a faulty word line in the primary array is input to the semiconductor memory, the value of the address bit assuming one of two complementary states depending upon the address location of the faulty word line in the primary array, said circuit comprising:

enabling means connected to the redundant word line for receiving a first enabling signal having first and second complementary values which correspond to the first and second complementary states of the predetermined address bit associated with the faulty word line and for receiving a second enabling signal having first and second complementary values inverted relative to said complementary values of said first enabling signal, said enabling means operating to enable the redundant word line when said first value of said first enabling signal is received by said enabling means, said enabling means also operating to enable the redundant word line when said second value of said second enabling signal is received by said enabling means;

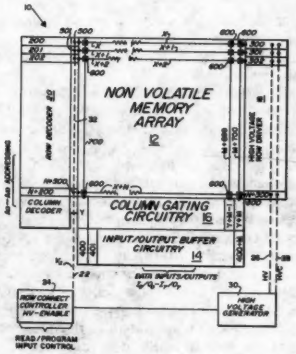
output means connected to receive an output signal and a complementary output signal for supplying said enabling means with said first enabling signal in response to said output and complementary output signals having a first pair of complementary output values and for supplying said enabling means with said second enabling signal in response to said output and complementary output signals having a second pair of complementary output values inverted relative to said first pair of complementary output values; and

programmable means for supplying said output means with said output and complementary output signals, said programmable means including a single fuse element which assumes one of two fuse states depending upon the state of the predetermined address bit associated with the faulty word line, said first fuse state of said single fuse element causing said programmable means to generate said first pair of complementary output values for said output and complementary output signals, said second fuse state of said single fuse element causing said programmable means to generate said second pair of complementary output values for said output and complementary output signals.

4,617,652
INTEGRATED HIGH VOLTAGE DISTRIBUTION AND CONTROL SYSTEMS

Richard T. Simko, Los Altos, Calif., assignor to Xicor, Inc., Milpitas, Calif.

Continuation-in-part of Ser. No. 367,264, Apr. 12, 1982, Pat. No. 4,520,461, which is a continuation-in-part of Ser. No. 230,683, Feb. 2, 1981, Pat. No. 4,486,769, which is a continuation-in-part of Ser. No. 6,026, Jan. 24, 1979, Pat. No. 4,314,265, and a continuation-in-part of Ser. No. 6,030, Jan. 24, 1979, Pat. No. 4,274,012. This application Jun. 6, 1983, Ser. No. 501,277
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—203 **7 Claims**



1. In an integrated circuit nonvolative memory device comprising an array of nonvolatile addressable memory elements connected to row and column address lines, row decoder circuitry for applying a predetermined logic level potential to a selected row line of the memory array and column circuitry for I/0 addressing of a selected column address line, the improvement comprising:

coupling/decoupling means for electrically isolating a selected row line at said predetermined potential from the row decoder circuitry, said means including first and second transistors each having a source, drain and gate, the drain of said second transistor being connected to the row line, the source of said first transistor being connected to the row decoder circuitry, the source of said second transistor and the drain of said first transistor being connected together, means connected to the gate of said first transistor for selectively causing said first transistor to be in a non-conductive state so as to isolate said selected row line from said row decoder circuitry, and means connected to the gate of said second transistor for maintaining said second transistor in a conductive state; and

low power high voltage charging means for charging the selected, isolated row line at said predetermined potential to a higher potential while preventing charging of unselected row lines to such higher potential, said means including a third transistor for controlling the application of said higher potential to said isolated row line and a fourth transistor for regulating the condition of said third transistor as a function of the potential of said isolated row line.

4,617,653

SEMICONDUCTOR MEMORY DEVICE UTILIZING MULTI-STAGE DECODING

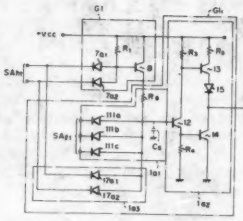
Yasuro Matsuzaki, Tama; Toshitaka Fukushima, Yokohama, and Kouji Ueno, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 28, 1983, Ser. No. 566,323

Claims priority, application Japan, Dec. 29, 1982, 57-233906

Int. Cl.[4] G11C *8/00, 11/36*

U.S. Cl. 365—230 **16 Claims**



1. A semiconductor memory device operatively connected to receive address signals, comprising:

a plurality of memory cells arranged in a matrix having columns and rows; and

decoder means, operatively connected to said plurality of memory cells, for selecting one row of said matrix in response to the address signals, said decoder means comprising:

a first-stage decoder having a plurality of first-stage decoding elements having output terminals, said first-stage decoder operatively connected to receive predetermined ones of the address signals; and

a second-stage decoder having a plurality of second-stage decoder circuit groups each including a plurality of second-stage decoding elements having output terminals, each of said second-stage decoder circuit groups operatively connected to said corresponding first-stage decoding elements, said second-stage decoder receiving further address signals in addition to said predetermined ones of the address signals connected to said first-stage decoder.

4,617,654

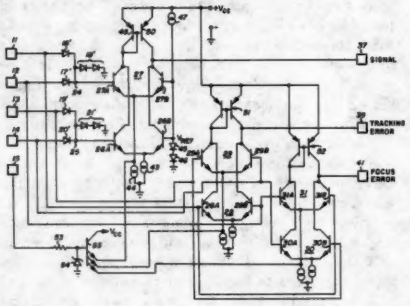
MATRIX CIRCUIT FOR OPTICAL DISC SYSTEMS

William H. Gross, Sunnyvale, Calif., and Toyojiro Naokawa, Tsurugashimamachi, Japan, assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 12, 1984, Ser. No. 619,965

Int. Cl.[4] G11B *7/13*

U.S. Cl. 369—46 **5 Claims**



1. An integrated circuit for combining the photocurrents produced by a four quadrant photodetector array in a single beam optical disc system or by a six photodetector array in a three-beam optical disc system to produce signal, tracking error, and focus error outputs, said circuit comprising:

first, second, third and fourth input terminals for receiving photocurrents from a photodetector array;

a fifth input terminal for receiving a logic signal determined by which of the two systems is employed;

conductive means connected to each of said first, second, third and fourth terminals for conducting said photocurrents to a common circuit point, said conductive means being connected in a branching configuration whereby said photocurrents in said input terminals can be combined in pairs;

three pairs of op amps having differential input terminals coupled to respond to said photocurrents in said first, second, third and fourth input terminals with the output terminals of each pair being coupled together in a summer to produce one of said outputs; and

means responsive to the logic signal on said fifth input terminal for turning one op amp in each of said three pairs on and off.

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HOLDER FOR A RIGID INFORMATION DISC AND LOADING-SYSTEM COMPRISING A LOADING MECHANISM ADAPTED TO COOPERATE WITH SUCH A HOLDER

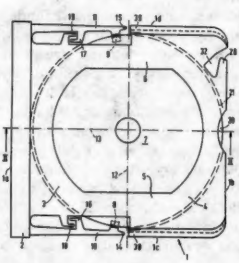
Ghislanus M. A. M. Aldenhoven, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 15, 1985, Ser. No. 734,378

Claims priority, application Netherlands, May 25, 1984, 8401672

Int. Cl.[4] B65D *85/02;* G11B *23/02*

U.S. Cl. 369—291 **24 Claims**

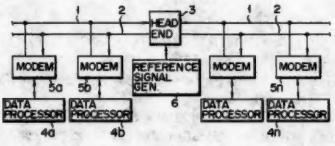


1. A holder for a rigid information disc, including a rectangular frame which includes a first disc-supporting section situated near a first peripheral side of the frame and a second disc-supporting section adjoining a second peripheral side located opposite the first peripheral side, which frame carries movable clamping means for retaining the information disc on the frame and is at least in part resiliently deflectable and returns from a deflected position to a flat position, characterized in that the first and the second disc-supporting sections are interconnected by at least one deflectable and resilient connecting element which cooperates with the frame in its deflected position, in which position the first and second peripheral sides extend at least substantially parallel to one another, and further characterized in that the clamping means comprise actuating portions and said clamping means are situated near said connecting element, and in the deflected position of the frame said clamping means release the information disc only after said actuating portions have been actuated.

4,617,656
INFORMATION TRANSMISSION SYSTEM WITH MODEMS COUPLED TO A COMMON COMMUNICATION MEDIUM

Hiroshi Kobayashi; Tsuguhiro Hirose, both of Tokyo, and Hideaki Haruyama, Fujisawa, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 563,241, Dec. 19, 1983, abandoned. This application Jan. 2, 1986, Ser. No. 814,598
Claims priority, application Japan, Dec. 22, 1982, 225216/82
Int. Cl.⁴ H04J *1/02, 3/12*
U.S. Cl. 370—74 **30 Claims**



1. An information transmission system comprising:

a communication line having a transmission path and a reception path and means for coupling information signals present on said transmission path to said reception path at a predetermined point of said line;

a plurality of information processing devices;

a plurality of modems for coupling said information processing devices to said communication line at arbitrary points thereof and for permitting transmission and reception of information signals among said information processing devices through said communication line, each modem including a transmitting amplifier to transmit an information signal from a corresponding information processing device to said transmission path of said communication line and a receiving amplifier to receive an information signal transmitted to said transmission path by any of said modems through said predetermined coupling point of said transmission and reception paths and said reception path;

a pilot signal providing means for sending out to said communication line a pilot signal of a predetermined reference level which is capable of being received by said receiving amplifier of each of said modems; and

each of said modems further including:

reception level detecting means coupled to said receiving amplifier for detecting the reception level of a signal received through said reception path; and

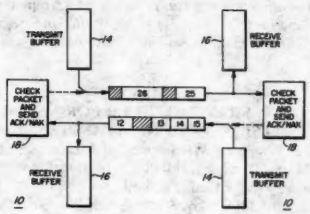
gain adjusting means responsive to said reception level detecting means for adjusting the gain of said transmitting amplifier such that the reception level of a transmission signal, which is transmitted to said transmission path by said transmitting amplifier and received by said receiving amplifier through said predetermined coupling point of said transmission and reception paths and through said reception path, becomes substantially equal to the reception level of the pilot signal received by said receiving amplifier.

4,617,657
TRANSMITTING SEQUENCE NUMBERS OF INFORMATION IN A PACKET DATA TRANSMISSION SYSTEM

David S. Drynan, and David M. Baker, both of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Dec. 31, 1984, Ser. No. 688,110
Int. Cl.⁴ H04Q *11/04*
U.S. Cl. 370—60 **37 Claims**

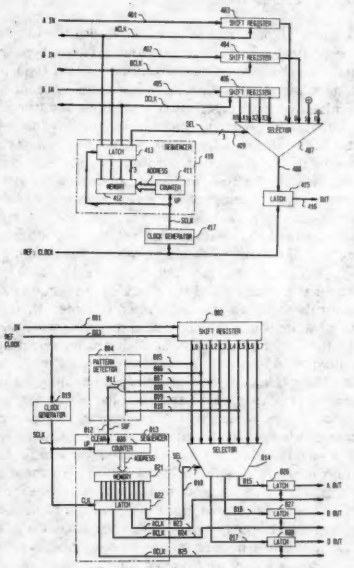
1. A method of transmitting sequence numbers of information packets in a packet data transmission system, each information packet comprising a control field and an information field, the control field of each information packet including a sequence number of the information packet, comprising the steps of selectively transmitting in said information packet the sequence number of an information packet received in an opposite direction of transmission thereby to acknowledge correct receipt of the received information packet, and transmitting in the control field of each information packet a bit whose state indicates the presence or absence in the information packet of the sequence number of a received information packet being acknowledged.



4,617,658
FRAME ARRANGEMENT FOR MULTIPLEXING A PLURALITY OF SUBCHANNELS ONTO A FIXED RATE CHANNEL

Stephen M. Walters, Holmdel, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Apr. 17, 1985, Ser. No. 724,199
Int. Cl.⁴ H04J *3/16, 3/00, 3/12*
U.S. Cl. 370—84 **10 Claims**



1. A method for multiplexing a plurality of digital subchannels onto a fixed rate digital channel by forming successive frames of bits comprising the steps of:

forming said frames so that each frame consists of j i-tuples of bits, i being mathematically predetermined as a function of the rates of each of said digital subchannels and the rate of said fixed rate digital channel,

setting in each frame each bit in one of said j i-tuples to one predetermined binary digit,

setting in each frame one fixed bit at one end of each of the other j−1 i-tuples to a predetermined binary digit opposite to the digit set as each bit of said one i-tuple, and

distributing in each frame in a predetermined pattern in the remaining (i−1)(j−1) bit positions an integral number of bits from each of said subchannels.

4,617,659
FRAME ALIGNER FOR USE IN TELECOMMUNICATIONS SYSTEMS

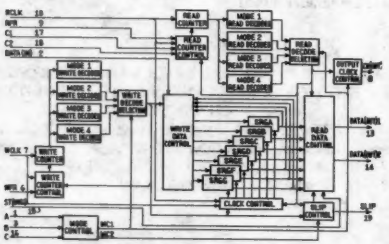
Geoffrey Chopping, Wimborne; Ian J. Lawrie, Poole, and Milan Z. Maric, Wimborne, all of England, assignors to The Plessey Company plc, Ilford, England

Filed Nov. 8, 1984, Ser. No. 669,358

Claims priority, application United Kingdom, Dec. 13, 1983, 8333214

Int. Cl.[4] **H04J** *3/06;* **H04L** *7/00, 25/36, 25/40*

U.S. Cl. 370—100 **4 Claims**



1. A frame aligner for use in a time division multiplex communication system of the synchronous network type in which a digital data bit stream is transmitted over a data highway interconnecting a first communication exchange and a second communication exchange, each exchange incorporating its own individually operating clock arrangement for defining a time division frame, the frame aligner comprising: seven quarter frame shift register sections, each section being independently accessible for read and write operations; a read select counter arranged to select the shift register section from which the next quarter frame of data is to be read; a write select counter arranged to select the shift register section into which the next quarter frame of data received on the data highway is to be fed; a slip mechanism which monitors the clock incoming from the first exchange and the clock of the second exchange, and controls the read select counter in order that the read select and write select counters do not concurrently select the same shift register section; a control means for selecting one of a plurality of modes of operation in which the aligner is to operate, the mode of operation selected enabling frame alignment either (1)between two separate and equal number channel digital p.c.m. systems or (2) between two separate and differing number channel digital p.c.m. systems; a phase locked loop for generaing a 1544 Kilo Hertz clock which is derived from an exchange 2048 Kilo Hertz clock: and three controls paths which are associated with said control means for application of one of a plurality of mode of operation control-codes to select the mode of operation in which the aligner is to operate;

wherein any one of four modes of operation is selected by the application of any one of four separate and different three-bit mode of operation selection codes to the three mode of operation control-paths;

wherein in the first mode of operation, the aligner frame aligns between a received p.c.m. line signal at a data rate of 2048 Kilo bits per second and a p.c.m. exchange data rate of 2048 Kilo bits per second where the frame synchronisation rate is 8 Kilo Hertz;

wherein the second mode of operation, the aligner frame aligns and frequency changes between a received p.c.m. line signal at a data rate of 1544 Kilo bits/second and a p.c.m. exchange data rate of 2048 bits/second where the frame synchronisation rate is 8 Hertz;

wherein the third mode of operation, the aligner effects conversion from an exchange data rate of 2048 Kilo bits per second to a line data rate of 1544 Kilo bits per second using the phase locked loop; and

wherein in the fourth mode of operation, the aligner operates as in the first mode of operation, and is controlled to ensure alignment with minimum delay where no significant jitter or wander is expected.

4,617,660
FAULTY-MEMORY PROCESSING METHOD AND APPARATUS

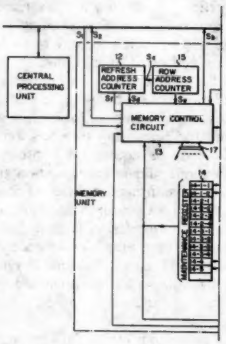
Yasuhiko Sakamoto, Fujisawa, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

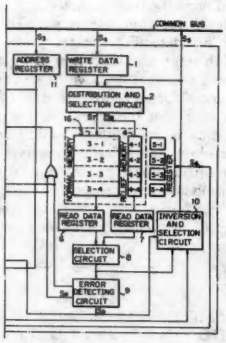
Filed Mar. 8, 1984, Ser. No. 587,518

Claims priority, application Japan, Mar. 10, 1983, 58-039674

Int. Cl.[4] **G06F** *11/10;* **G11C** *29/00*

U.S. Cl. 371—13 **15 Claims**





1. A faulty memory processing method in a data processing system including memory means having a normal memory with a plurality of cells for storing information, a relief memory, and error correction means for detecting and correcting an error in information read out from at least one cell in said normal memory, said data processing system executing a time-sharing data process with time period breaks, said faulty-memory processing method comprising the steps of:

detecting a hard error which may exist in at least one cell in

said normal memory, said detection being carried out using said error correction means;

correcting, using said error correction means, an error in information read out from a detected harderror cell of the normal memory;

transcribing information including the corrected information with respect to the detected hard-error cell of the normal memory into the relief memory, said correcting and transcribing steps being executed during the time period breaks in said time-sharing data process; and

processing in a normal mode where data read out from the memory means are immediately utilized without waiting for the detection and correction performed by the error

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4,617,661

ELECTRONIC COPYING MACHINE

Kenji Futaki, Kawasaki, and Hitoshi Dekura, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

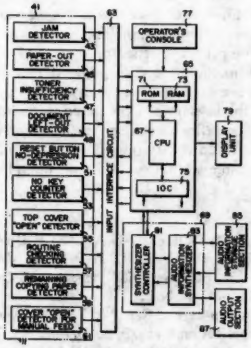
Division of Ser. No. 363,387, Mar. 29, 1982, Pat. No. 4,500,971. This application Nov. 7, 1984, Ser. No. 669,229

Claims priority, application Japan, Mar. 31, 1981, 56-48073

The portion of the term of this patent subsequent to Feb. 19, 2002, has been disclaimed.

Int. Cl.[4] G01R *31/28*

U.S. Cl. 371—20 **1 Claim**



1. An electronic copying machine comprising:

a copying machine main body;

fault detecting means for detecting at least one fault in the operation of said copying machine main body, each said fault being correctable by a sequence of manual operations;

operation detecting means for detecting the occurrence of each of said manual operations;

information storage means for storing instructions for said manual operations;

output means for outputting any of said instructions stored in said information storage means; and

control means for: (1) causing said output means to output one of said instructions related to the first manual operation in said sequence to correct one of said faults detected by said fault detecting means, (2) causing said output means to output one of said instructions related to the next manual operation in said sequence to correct said detected fault when said operation detecting means detects the occurrence of said manual operation previously instructed by output of said output means, and (3) repeating said function (2) until instructions for all of said manual operations necessary to correct said detected fault have been outputted by said output means.

4,617,662

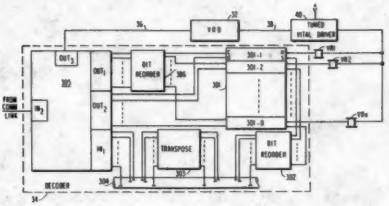
VITAL MESSAGE SYSTEM WITH UNIQUE FUNCTION IDENTIFICATION

John H. Auer, Jr., Fairport; Henry C. Sibley, Adams Basin, and Leslie C. Stewart, Rochester, all of N.Y., assignors to General Signal Corporation, Stamford, Conn.

Filed Dec. 12, 1983, Ser. No. 560,669

Int. Cl.[4] G06F *11/08*

U.S. Cl. 371—25 **27 Claims**



6. A system for sensing the binary condition of plural input lines comprising:

(a) a plurality of sense circuits, equal in number to the number of input lines, each sense circuit including an input terminal connected to a corresponding input line, a drive terminal, a sense output terminal, means for producing, at said sense output terminal a signal related to a signal at said drive terminal if said input line is in one binary condition and for otherwise producing a null sense output regardless of the drive input,

(b) a multi-conductor bus with at least a separate conductor for each input line in a group of input lines,

(c) first connector means for connecting conductors of said bus to different drive terminals of said sense circuits and second conductor means for connecting conductors of said bus to different sense output terminals of said sense circuits,

(d) transposing means for transposing a time sequence of bit parallel, word serial, words on said bus to place a time sequence of bit serial, word parallel words on said bus,

(e) processor means for writing a time sequence of vital and direct test words to aid bus and for controlling said transposing means to operate only in response to said vital test words, and including means responsive to resulting vital state and direct state words to determine the state of said group of input lines.

4,617,663

INTERFACE TESTING OF SOFTWARE SYSTEMS

Carole J. Lake, Freehold; James J. Shanley, Middletown, and Steven M. Silverstein, Red Bank, all of N.J., assignors to AT&T Information Systems Inc., Holmdel, N.J.

Continuation of Ser. No. 484,465, Apr. 13, 1983, abandoned. This application Oct. 7, 1985, Ser. No. 785,029

Int. Cl.[4] G06F *11/00*

U.S. Cl. 371—25 **15 Claims**

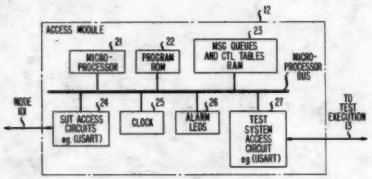
1. A test device for use in conjunction with a system having a plurality of operations occurring within said system, said system having at least one interface point through which system messages pass, said system messages being either messages representative of operations occurring within said system or messages for controlling operations to be performed within said system, said test device comprising,

means for obtaining a plurality of scripts, each script associated with a particular test sequence and having a plurality of language statements pertaining to said test sequences, each said script also containing language statements pertaining to the results which are expected as a consequence of test sequences applied to a particular system,

means including a data base unique to a particular system

under test and responsive to said means for obtaining for converting said language statements of an obtained script into a plurality of messages tailored to said particular system, certain of said messages for application to said system under test via said interface point to simulate certain system operations, and certain of said messages for comparison with messages received via said interface point as a result of said simulation messages being applied to said interface point, and

means responsive to messages received from said interface point as a consequence of messages communicated at said interface point of said system under test for comparing said received messages with said script comparison messages to provide an indication as to the proper functioning of said system under test.

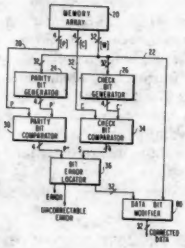


4,617,664

ERROR CORRECTION FOR MULTIPLE BIT OUTPUT CHIPS

Frederick J. Aichelmann, Jr., Hopewell Jct., and Lawrence K. Lange, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1984, Ser. No. 626,276
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—38 **11 Claims**



1. A method of error correcting a data word consisting of a plurality of subwords, each subword consisting of a plurality of bits, comprising the steps of:

computing a first set of parity bits, a parity bit being computed from each subword of an original data word;

computing a first set of check bits from said original data word according to an error correction code;

computing a second set of parity bits, a parity bit of said second set being computed from each subword of a data word derived from said original data word, said derived data word consisting of a plurality of subwords, each subword consisting of a plurality of bits;

differencing the corresponding bits of said first and second sets of parity bits to produce a set of parity bit error signals, parity bit error signals not having a predetermined value indicating non-equality between said original data word and said derived data word;

computing a second set of check bits from said derived data word according to said error correction code;

differencing the corresponding bits of said first and second sets of check bits to produce a set of syndrome bits; and

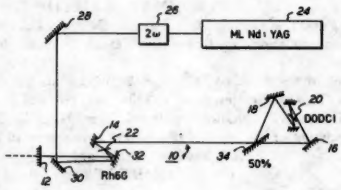
computing from said set of parity bit error signals and said set of syndrome bits according to said error correction code the bit locations in which said original data word differs from said derived data word.

4,617,665

DYE LASER

Gerard Mourou, Rochester, N.Y.; Theodore B. Norris, Huntington, Pa., and Theodore Sizer, II, Rochester, N.Y., assignors to University of Rochester, Rochester, N.Y.

Filed Jun. 8, 1984, Ser. No. 618,715
Int. Cl.[4] H01S *3/098*
U.S. Cl. 372—18 **14 Claims**



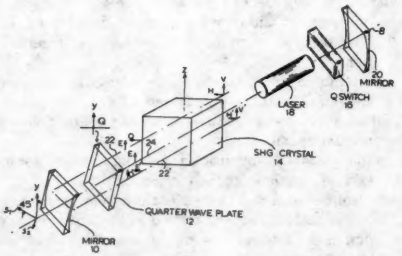
1. A CPM dye laser system which generates laser pulses and having a laser cavity, comprising: an anti-resonant ring in said cavity defining a 100% reflector at one end of said laser cavity, and means including a CW pumped mode-locked laser for pumping a laser dye gain medium with pump pulses synchronous with the laser pulses generated in said cavity, the length of said cavity defined between said ring and another reflector at the end of said cavity opposite to said one end said length being adjustable so that synchronous pumping occurs.

4,617,666

FREQUENCY DOUBLING A LASER BEAM BY USING INTRACAVITY TYPE II PHASE MATCHING

Kuo-Ching Liu, Setauket, N.Y., assignor to Quantronix Corporation, Smithtown, N.Y.

Continuation-in-part of Ser. No. 724,089, Apr. 17, 1985. This application Oct. 29, 1985, Ser. No. 792,477
Int. Cl.[4] H01S *3/10*
U.S. Cl. 372—22 **9 Claims**



1. A frequency doubled laser comprising:

a first mirror;

a multimode laser active medium for generating a fundamental beam at a preselected frequency, said beam having a random polarization as a result of said active medium not being naturally birefringent, which polarization can be resolved into two coplanar orthogonal components;

a crystal with its optic axis parallel to one of said components having an ordinary and an extraordinary axis oriented along said orthogonal rays to generate a second harmonic beam in response to said orthogonal components, said crystal further generating a differential phase delay between said orthogonal rays;

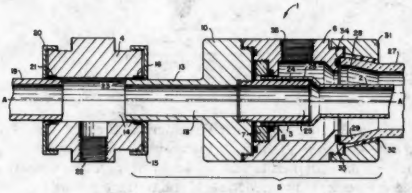
means for interchanging upon first passage through said means, reflection from the second mirror and return passage through said means the respective orientations of said orthogonal rays to eliminate by return passage through said SHG crystal said differential delay;

a second mirror, said first mirror and second mirror being arranged to form an optical cavity for said laser active medium, crystal and interchanging means.

4,617,667
GAS LASER TUBE ASSEMBLY

Wayne M. Penn, Cartersville, Ga., assignor to P.R.C., Ltd., Landing, N.J.

Filed Oct. 28, 1983, Ser. No. 546,741
Int. Cl.[4] H01S *3/02*
U.S. Cl. 372—35 **31 Claims**



1. A gas laser tube assembly comprising an elongated gas laser plasma tube, a fitting member for connection to the end of said elongated gas laser plasma tube, said fitting member being positioned adjacent one end of said elongated gas laser plasma tube and spaccd from said tube end along the longitudinal axis of said plasma tube, and releasable connection means extending between and releasably connected with said one end of said plasma tube and said fitting member spaced along the longitudinal axis from said plasma tube, one of said connection means and said fitting member having a bore and the other having an elongated projection extending a substantial distance along the longitudinal axis of said tube and telescopically arranged within said bore so that said fitting member and said connection means can be moved with respect to one another in either direction along the longitudinal axis of said plasma tube at least upon release of said connection means thereby facilitating removal and installation of said plasma tube from said assembly.

4,617,668
CO_2 TEA LASER

Robert I. Rudko, Holliston, and James W. Barnie, Stoughton, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 394,583, Jul. 2, 1982. This application May 7, 1985, Ser. No. 731,619
Int. Cl.[4] H01S *3/22*
U.S. Cl. 372—59 **10 Claims**

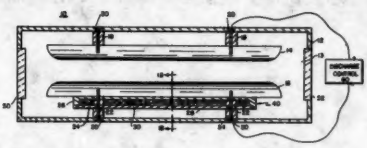
1. In combination:

an active fluid gain medium;

a sealed resonant cavity surrounding said active fluid gain medium;

a catalyst disposed within said seal resonant cavity; and

means for protecting said catalyst from electric field and shock waves present in said sealed resonant cavity, said protecting means comprising a conductive container, the catalyst being disposed therein, said conductive container

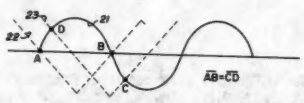


having a portion of a surface thereof permeably to said active fluid gain medium and impervious to said catalyst.

4,617,669
METHOD AND APPARATUS FOR PUMPING LASANT SLABS

Kelin J. Kuhn, Mountain View, Calif., assignor to Board of Trustees, Leland Stanford, Jr. University, Stanford, Calif.

Filed Dec. 3, 1983, Ser. No. 557,203
Int. Cl.[4] H01S *3/091*
U.S. Cl. 372—70 **14 Claims**



1. In a method for optically pumping a slab of lasant material of the type having a pair of spaced apart broad side faces and a pair of spaced apart narrow side faces, the steps of:

internally reflecting a laser beam of coherent radiation within the slab back-and-forth in a zig-zag path between and intersecting with the broad side faces as the coherent beam travels in a lengthwise direction within the slab falling in a mid-plane between the broad faces,

directing optical pumping radiation through at least one of said broad faces of said lasant slab for inverting the population densities of lasant energy levels within said lasant slab for transferring power into the laser beam;

the intensity of said pumping radiation, as directed into said lasant slab, being spatially periodic taken in the lengthwise direction of the travel of the laser beam within the slab and having an attendant spatially periodic temperature maxima profile within the lasant slab taken in the lengthwise direction of travel of the laser beam within the laser slab; and

positioning the periodicity of the thermal maxima profile relative to the periodicity of the zig-zag laser beam path such that each ray within the laser beam has generally the same zig-zag path length over the same length of the lengthwise path length of the laser beam within the slab.

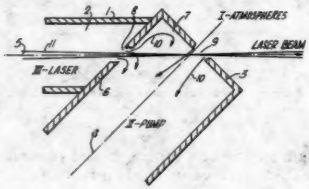
4,617,670
AERODYNAMIC WINDOWS FOR HIGH POWER LASERS

Alan S. Kaye, Wantage, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Mar. 11, 1985, Ser. No. 710,064
Claims priority, application United Kingdom, Mar. 26, 1984, 8407754
Int. Cl.[4] H01S *3/08*
U.S. Cl. 372—104 **4 Claims**

1. An aerodynamic window for a gas laser, comprising a chamber positioned at one end of a structure forming part of a laser cavity in which lasing action can take place, the chamber having first and second apertures aligned with the optical axis of the laser cavity and the longitudinal axis of the chamber at an acute angle to the optical axis of the laser optical cavity, and

for permitting the chamber to be continuously evacuated such that an intermediate pressure is established in said chamber relative to a lower pressure in said laser cavity and a higher



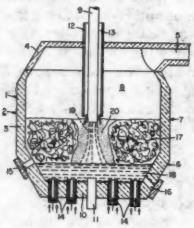
pressure outside of said chamber, wherein the chamber is of uniform cross-section and the apertures are situated in a side wall and an end wall of said chamber, respectively thereby providing an aerodynamic window.

4,617,671

ARRANGEMENT FOR PRODUCING METALS, SUCH AS MOLTEN PIG IRON, STEEL PRE-MATERIAL AND FERROALLOYS

Walter Lugscheider, Linz; Paul Müllner; Wilhelm Schiffer, both of Traun, and Alois Leutgöb, Steyr, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Division of Ser. No. 558,034, Dec. 5, 1983, Pat. No. 4,533,385.
This application Jan. 30, 1985, Ser. No. 696,357
Claims priority, application Austria, Dec. 7, 1982, 4445/82
Int. Cl.[4] H05B *7/00*
U.S. Cl. 373—22 **3 Claims**



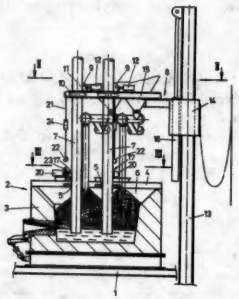
1. In an arrangement for producing metals, such as molten pig iron, steel pre-material and ferroalloys, of metal-oxide-containing raw material by melting said raw material and of the type including a refractorily lined metallurgical vessel having a vessel bottom and accommodating said raw material, a plasma burner directed from top to bottom and forming a plasma jet for melting said raw material, and a counter electrode arranged in said vessel bottom, the improvement which comprises a jacket peripherally surrounding said plasma burner so as to form a supply space peripherally surrounding said plasma burner and adapted to top-charge said raw material having fine-particle form into said metallurgical vessel in a flow parallel to said plasma jet so as to surround it peripherally, and nozzles provided in said vessel bottom to supply oxygen-containing gas and carbon into said metallurgical vessel so as to form foamed slag surrounding said plasma jet over its total height and peripherally surrounding said flow of fine-particle raw material.

4,617,672

ELECTRIC FURNACE ARRANGEMENT

Berahard Enkner; Leopold Amon, both of Linz; Alfred Kübelböck, Zwettl/Rodl; Wolfgang Trimmel, Leoben; Paul Nalepka, Niklasdorf; Leopold Schropp, Linz; Helmut Schwaighofer, Neumarkt; Reinhard Pum, Linz; Manfred Traxler, Hart, and Franz Tasch, Bad Mitterndorf, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Sep. 13, 1985, Ser. No. 775,538
Claims priority, application Austria, Sep. 18, 1984, 2963/84
Int. Cl.[4] H05B *7/00*
U.S. Cl. 373—79 **4 Claims**



1. In an electric furnace arrangement of the type including a furnace vessel, a liftable and lowerable lid having at least one aperture and adapted to cover said furnace vessel, at least one electrode adapted to penetrate through the aperture in said lid into said furnace vessel, a liftable and lowerable supporting construction extending above said electric furnace and adapted to carry said electrode, and first clamping means adapted to fasten said electrode to said supporting construction, the improvement comprising second clamping means for said electrode arranged adjacent said aperture in said lid, at least one coupling element arranged on said supporting construction and at least one countercoupling element fastened to said lid, said coupling element being adapted to be brought into and out of engagement with said countercoupling element, to permit lifting of said lid.

4,617,673

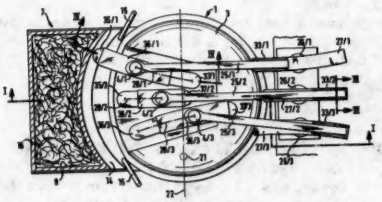
ELECTRIC ARC FURNACE HAVING A SPACE PROVIDED ON ONE SIDE OF THE FURNACE VESSEL FOR ACCOMMODATING CHARGING MATERIAL

Gerhard Fuchs, Kehl-Bodersweier, and Joachim Ehle, Lautenbach, both of Fed. Rep. of Germany, assignors to Fuchs Systemtechnik GmbH, Fed. Rep. of Germany

Filed May 29, 1985, Ser. No. 738,965
Claims priority, application Fed. Rep. of Germany, Jun. 8, 1984, 3421485
Int. Cl.[4] H05B *7/10, 7/00*
U.S. Cl. 373—80 **17 Claims**

1. An electric arc furnace comprising a furnace vessel (2), means defining a space (8) for accommodating charging material provided on one side of said furnace vessel and connected to the interior (11) of said furnace vessel, a cover (3) for closing said furnace vessel, electrode-passing means (38/1) located in said cover, at least one arc electrode (4/1, 4/2, 4/3) having one end thereof able to protrude via said electrode-passing means into the interior (11) of said furnace vessel, an electrode carrier arm (25/1; 25/2, 25/3; 51/1, 51/2, 51/3) having holding means, the other end of said arc electrode being clamped into said holding means, said space (8) being disposed at least partially in the area of radiation of the arc of said at least one arc electrode, and electrode left mechanism (26/1, 26/2, 26/3), said electrode

carrier arm being connected to said electrode lift mechanism, characterized in that said electrode carrier arm is connected to said electrode lift mechanism by way of a horizontal guide means (27/1, 27/2, 27/3; 52/1, 52/2, 52/3) and is reciprocable along the guide means by a drive means which is operative in two directions, whereby the arc electrode and the furnace vessel are displaceable relative to each other in such a way that



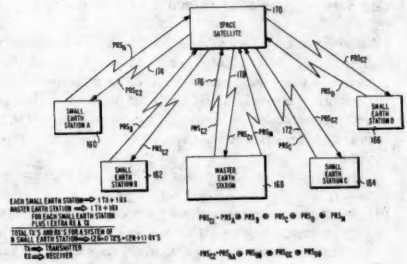
the arc electrode can be put into a central position in the furnace vessel or a position adjacent the charging material accommodating space (8), and said electrode-passing means comprises means for passing said arc electrode therethrough provided in the central region of the cover and means for passing said arc electrode therethrough provided at a location in the cover which is adjacent to the charging material accommodating space.

4,617,674

SYNCHRONIZING SYSTEM FOR SPREAD SPECTRUM TRANSMISSIONS BETWEEN SMALL EARTH STATIONS BY SATELLITE VIA AN INTERMEDIATE HOP TO A LARGE EARTH STATION

Visvaldis Mangulis, E. Brunswick, and Leonard N. Schiff, Lawrenceville, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jul. 14, 1983, Ser. No. 513,737
Int. Cl.[4] H04J *3/06*
U.S. Cl. 375—1 **6 Claims**



3. A communication network comprising:

a satellite;

a master earth station (MES);

a plurality of small earth stations (SES) each comprising logic for generating and transmitting in a first transmission hop to said MES via said satellite a stream of pseudo random sequence (PRS) signals PRS_{SES} having a repetition rate B_{SES} and each consisting of a plurality of chips occurring at a chip rate C_{SES}, and arranged in patterns unique to said each SES, and with each PRS signal representing a bit and further with said streams of PRS signals each having periodic pause periods therein consisting of a predetermined number of bit periods for receiving and carrying error correction command (ECC) signals;

said MES comprising:

means for generating, transmitting and then receiving back from said satellite a PRS signal PRS_M having a chip and bit clock rate C_M and B_M, respectively;

said MES further comprising means for receiving said PRS signals (PRS_{SES}) and for generating an ECC signal in response to the phase difference between C_M and the C_{SES} of each SES and the phase difference between B_M and the B_{SES} of each SES indicating the amount and direction of such phase differences;

said MES further comprising logic for detecting and identifying the occurrence of the periodic pause period of each SES and for inserting in such pause periods the ECC signal required for the SES to which the transmissions from said each SES are addressed; and

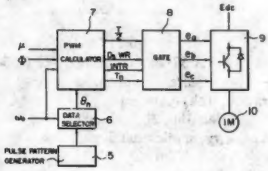
each of said SESs being responsive to an ECC addressed thereto to correct the phases of the C_{SES} and the B_{SES} of the PRS_{SES} unique thereto so that said C_{SES} and said B_{SES} are synchronized with C_M and B_M, as returned from the satellite, at the MES.

4,617,675

DIGITAL PWMED PULSE GENERATOR

Tadashi Ashikaga; Yoshihide Kamanaka, both of Tokyo, and Keiko Fushimi, Yokohama, all of Japan, assignors to Kabushiki Kaisha Meidensha, Japan

Filed Mar. 8, 1985, Ser. No. 709,580
Claims priority, application Japan, Mar. 8, 1984, 59-44380; Mar. 8, 1984, 59-44382
Int. Cl.[4] H03K *7/08*; H02M *7/217*; H02P *5/06*
U.S. Cl. 375—22 **9 Claims**



1. A digital PWMed pulse generator for generating a pulse-width-modulated pulse synchronizing with a sine wave, which comprises:

(a) means for generating plural series of digital pattern data determined by pulse-width-modulating a sine wave having a basic frequency and a basic amplitude in dependence upon a triangular carrier wave having a frequency integer times higher than that of the sine wave and an amplitude equal to that of the sine wave, the pattern data being classified into each series by the number of triangles included within a half cycle of the sine wave;

(b) means for selecting an appropriate series of digital pattern data classified by the number of triangles in response to an angular frequency command; and

(c) means for calculating other pattern data corresponding to another sine wave signal having an amplitude smaller than that of the selected pattern data in response to a voltage control ratio command; and

(d) means for generating a pulse-width-modulated pulse on the basis of the calculated pattern data.

4,617,676

PREDICTIVE COMMUNICATION SYSTEM FILTERING ARRANGEMENT

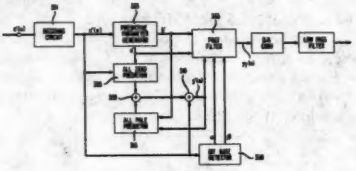
Nuggehally S. Jayant, Short Hills, N.J., and Venkatasubbarao Ramamoorthy, Linköping, Sweden, assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 4, 1984, Ser. No. 646,971
Int. Cl.[4] G10L *9/14*; H04B *14/06*
U.S. Cl. 375—27 **23 Claims**

14. In a digital communication system comprising a predic-

tive decoder including means for receiving digitally coded signals, means responsive to said received digital coded signals for generating a predictively decoded signal, zero and pole predictive parameter signals, and a signal representative of the communication system bit rate, a method for modifying the predictively decoded signal comprising the steps of:

generating zero predictive filter control signals and pole predictive filter control signals responsive to the communication system bit rate:



combining said zero predictive filter control signals with said zero predictive parameter signals to form a set of zero predictive spectral shaping parameter signals;

combining said pole predictive filter control signals with said pole predictive parameter signals to form a set of pole predictive spectral shaping parameter signals; and

modifying the frequency spectrum of the predictively coded signals responsive to said zero predictive spectral shaping parameter signals and said pole predictive spectral shaping parameter signals.

4,617,677

DATA SIGNAL READING DEVICE

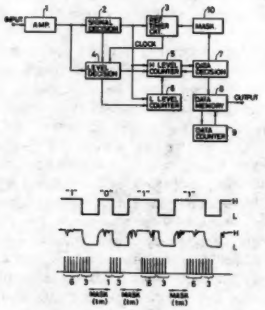
Toshihiko Chiba, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jan. 30, 1985, Ser. No. 696,554

Claims priority, application Japan, Jan. 31, 1984, 59-11967[U]

Int. Cl.[4] H04L *1/00*

U.S. Cl. 375—94 **2 Claims**



1. A data signal reading device for reading an input signal in which data signal segments representing "1" and "0" are determined separately according to two different durations of one of two different levels and a predetermined duration of the other level is provided between said data signal segments representing "1" and "0", comprising:

level decision means for subjecting an input signal to level decision while sampling said input signal with a clock pulse having a predetermined period to provide decision outputs;

a first counter for counting a number of times of occurrence of said one level in response to said decision outputs;

a second counter for counting a number of times of occurrence of said other level in response to said decision outputs;

means for initializing said second counter when it is determined that said decision output is of said one level;

means for for suspending the counting operations of said first and second counters for a period of time slightly longer than the shorter of said two different durations when the content of said second counter reaches a predetermined value; and

data decision means for determining data signal segments "1" and "0" in said input signal according to the content of said first counter obtained when the content of said second counter reaches said predetermined value.

4,617,678

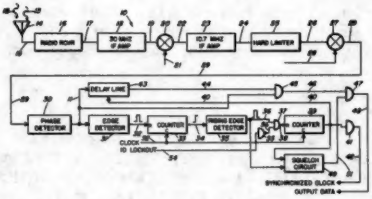
APPARATUS FOR DETECTING AND RECOVERING BINARY DATA FROM AN INPUT SIGNAL

Walter L. Devensky, and Carlos M. Dube, both of Boca Raton, Fla., assignors to Allied Corporation, Morristown, N.J.

Filed Jul. 27, 1984, Ser. No. 635,372

Int. Cl.[4] H04B *1/10*; H04L *7/02*

U.S. Cl. 375—102 **20 Claims**



14. A method for recovering binary data from an input signal wherein each bit of said data has a predetermined time interval and wherein first and second voltage levels represent a 1 and 0 of said data respectively comprising the steps of:

(1) deriving a synchronized clock from said data synchronized with respect to said predetermined time intervals, said deriving step further including subsequent steps (a)-(e)

(a) detecting transitions in said input signal between said first and second voltage levels and generating an output signal in response to said detected transitions,

(b) counting a clock signal with a first counter having a clock input, a reset input and an output, resetting said first counter after it counts up to a first predetermined value,

(c) resetting said first counter at times a transition is detected,

(d) counting a clock signal with a second counter having a clock input, a reset input and an output and resetting itself after it counts up to a second predetermined value,

(e) resetting said second counter at times said first counter reaches a third predetermined value, said output of said second counter providing said synchronized clock,

(2) generating binary data from said input signal with the output of said second counter, and

(3) inhibiting said generated binary data as a function of the outputs of said first and second counters indicative of a nonsynchronized clock.

20. A method for deriving a synchronized clock from an input signal containing binary data wherein each bit of said data has a predetermined time interval and wherein first and second voltage levels represent a 1 or 0 of said data respectively comprising the steps of:

detecting transitions in said input signal between said first and second voltage levels and generating an output signal in response to said detected transitions,

counting a clock signal having a predetermined frequency with a first counter having a clock input, a rest input and

an output, resetting said first counter after it counts up to a first predetermined value,

resetting said first counter at times a transition is detected,

counting a clock signal having a predetermined frequency with a second counter having a clock input, a reset input and an output and resetting itself after it counts up to a second predetermined value, and

resetting said second counter at times said first counter reaches a third predetermined value, said output of said second counter providing said synchronized clock.

4,617,679

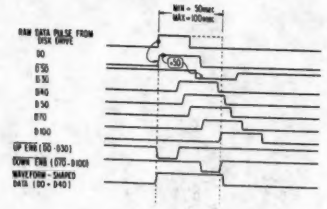
DIGITAL PHASE LOCK LOOP CIRCUIT

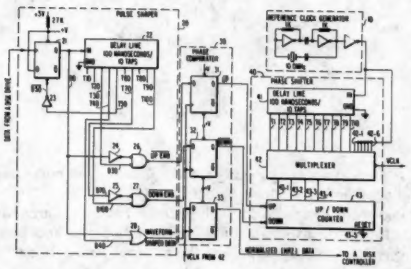
Phillip L. Brooks, Northborough, Mass., assignor to NEC Electronics U.S.A., Inc., San Mateo, Calif.

Filed Sep. 20, 1983, Ser. No. 534,058

Int. Cl.[4] H03L *7/08*

U.S. Cl. 375—119 **11 Claims**





1. A circuit for producing a sampling clock signal for sampling an input data pulse signal, comprising:

a reference clock pulse generator generating a reference clock pulse signal;

first means responsive to a phase control signal for producing a phase-shifted reference clock signal from said reference clock pulse signal to obtain a sampling clock signal;

second means responsive to an input data pulse signal for producing a first comparison signal only during a first interval within each one bit period of said input data pulse signal;

third means responsive to said input data pulse signal for producing a second comparison signal only during a second interval within each one bit period of said input data pulse signal, said first and second intervals being shorter than said one bit period of said input data pulse signal and separated from each other to leave a third interval therebetween;

a phase comparator for comparing said sampling clock signal with said first and second comparison signals and producing a first error signal when said sampling clock signal occurs during said first interval and a second error signal when said sampling clock signal occurs during said second interval, said phase comparator producing no error signal when said sampling clock occurs during said third interval; and

fourth means responsive to said first and second error signals for producing said phase control signal, whereby a predetermined phase relationship is maintained between said sampling clock signal and said input data pulse signal.

4,617,680

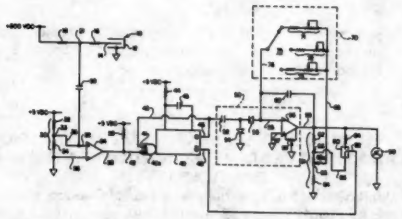
DEAD TIME COMPENSATION CIRCUIT FOR RADIATION DETECTOR

Joseph G. Johnston, Newbury, Ohio, assignor to Bicron Corporation, Newbury, Ohio

Filed Dec. 22, 1983, Ser. No. 564,298

Int. Cl.[4] G01T *1/18;* G06M *11/00*

U.S. Cl. 377—10 **8 Claims**



1. In a rate meter type random event counter circuit having a dead time characteristic wherein two or more successive random events during a predetermined period of time erroneously generate an event count signal indicative of only a single count, the occurrence of such erroneous single count signals increasing as the frequency of the random events increases, the random event counter circuit including active circuit element means having an input responding to event count signals including as a portion thereof said erroneous single count signals, and an output providing a signal having a value intended to indicate the actual rate of the random events, a dead time compensation circuit comprising:

means for detecting the frequency of said event count signals; and

means responsive to the detecting means for non-linearly modifying a transfer function of the active circuit element means as a direct function of the frequency of the event count signals so that the said value of the output signal from the circuit element means increases and decreases in substantially linear proportion to the actual number of random events per unit of time regardless of the proportion of said event count signals constituted by said erroneous single count signals.

4,617,681

BISTABLE ALIGNER CARTRIDGE FOOT

Carlo LaFiandra, New Canaan, and Justin Kreuzer, Trumbull, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed May 1, 1984, Ser. No. 605,941

Int. Cl.[4] G21K *5/00;* A61B *6/08*

U.S. Cl. 378—34 **4 Claims**

1. In an x-ray lithographic system comprising:

a plurality of work stations each having substantially identical kinematic mounts;

a cartridge movably located on support means;

means for mounting a wafer and a mask on said cartridge;

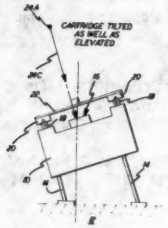
means for moving said cartridge between said stations;

means for moving said cartridge to a kinematic mount;

an improvement comprising:

a bistable foot operable in a first linear elevational mode and in a second angular compliance mode to bring said cartridge into contact with said kinematic mounts;

said bistable foot comprising a first piston means for elevating said cartridge with respect to said support means and a second piston means operable between a first mode



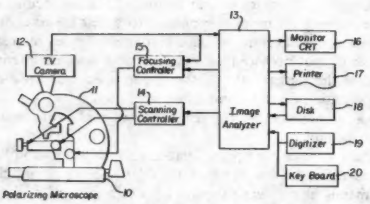
wherein said cartridge is rigidly connected to said support means and a second mode wherein said cartridge is flexibly connected to said support means.

4,617,682

METHOD AND APPARATUS FOR AUTOMATIC QUANTITATIVE MEASUREMENT OF TEXTURES BY IMAGE ANALYSIS

Makihiko Mori, Kitakatsuragigun; Kazuo Nakamura, Habikinoshi; Kanichiro Tanabe, Sagamiharashi, and Atsushi Kimura, Urawashi, all of Japan, assignors to Osaka Gas Company Limited and Nireco Corporation, both of, Japan

Filed Mar. 25, 1985, Ser. No. 715,876
Claims priority, application Japan, Mar. 27, 1984, 59-57393
Int. Cl.[4] G06K *9/00*; H04N *7/18*
U.S. Cl. 382—28 **22 Claims**



1. A method of automatic quantitative measurement of textures by image analysis for measuring textures of a material containing various optical anisotropic textures, comprising the steps of;

(a) picking up a microscopic texture image of the material by a TV camera,

(b) dividing the texture image picked up by the TV camera into a plurality of pixels arranged vertically and horizontally, brightness of the pixels being classified into a plurality of stages to be stored in a frame memory as gray levels of the pixels,

(c) selecting a portion of the image stored in the frame memory to be a base area,

(d) selecting at least one reference area on the stored image, said reference area being equal in shape to the base area and displaced from the base area in an optional direction,

(e) obtaining gray level variations of the reference area with respect to the base area, and

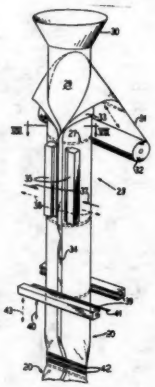
(f) identifying the textures based on a correlation between the textures to be measured and the gray level variations concerning the textures.

4,617,683

RECLOSABLE BAG, MATERIAL, AND METHOD OF AND MEANS FOR MAKING SAME

Paul B. Christoff, Lisle, Ill., assignor to Minigrip, Inc., Orangeburg, N.Y.

Filed Jan. 30, 1984, Ser. No. 574,878
Int. Cl.[4] B65D *33/16*
U.S. Cl. 383—63 **11 Claims**



1. A reclosable bag having a body with top and bottom ends and confronting walls, and comprising:

said walls formed from web material having a longitudinal formation axis extending between said top and bottom ends of the bag body, and the material joined to itself at a joint extending between said top and bottom ends and along one side of the body;

and a continuous one-piece extruded resiliently flexible plastic profiled reclosable fastener strip extending across said joint and secured to both of said walls at one end of the bag body; and extending lengthwise across said longitudinal formation axis of said web material;

said reclosable fastener strip being folded upon itself at said joint and having integral therewith interlockable resiliently flexible profiles which are aligned and releasably interlockable with one another in the folded strip.

DESIGN PATENTS

GRANTED OCT. 14, 1986

ERRATA

For CLASS	See PATENT NO.
D08–381	286,156
D03–101	186,171

DESIGNS

OCTOBER 14, 1986

286,100

WRAP-AROUND PANTY OR SIMILAR ARTICLE

Susan A. Sawicki, 8347 Ranchito Ave., Panorama City, Calif. 91402

Filed Aug. 29, 1983, Ser. No. 527,421

Term of patent 14 years

U.S. Cl. D2—42

286,101

SPACEMAN'S HELMET

Ronald J. Woodleigh, Castle Hill, Australia, assignor to Sunlea Developments Pty Ltd and Arthur Edward Pty. Ltd., both of Newcastle, Australia

Filed Feb. 21, 1984, Ser. No. 581,655

Term of patent 14 years

U.S. Cl. D29—15

286,102

SHOE

Ralph L. Lowe, Jr., Pearland, Tex., assignor to Aspri Sports, Inc., Pearland, Tex.

Filed Apr. 17, 1984, Ser. No. 601,239

Term of patent 14 years

U.S. Cl. D2—309

286,103

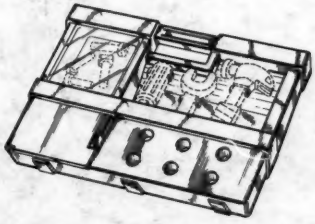
TOOLBOX/WORKSHOP

Martin Blumenthal, 99 Longview Ave., Chatham, N.J. 07928

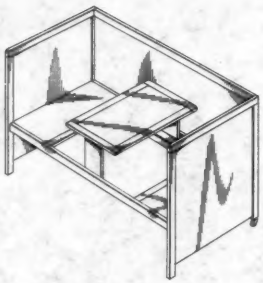
Filed Sep. 19, 1983, Ser. No. 533,369

Term of patent 14 years

U.S. Cl. D3—73



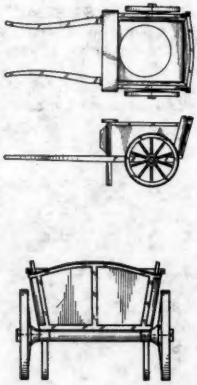
286,104
COMBINED TABLE AND PLURAL SEAT UNIT
Brian B. Trainis, Fulwood House, Durford Wood, Hampshire GU31 5AL, England, and Dragoslava Punisi , Oktobar, Yugoslavia, assignors to Brian Bernard Trainis, England
Filed Apr. 26, 1984, Ser. No. 603,932
Claims priority, application United Kingdom, Nov. 28, 1983, 1016576
Term of patent 14 years
U.S. Cl. D6—337



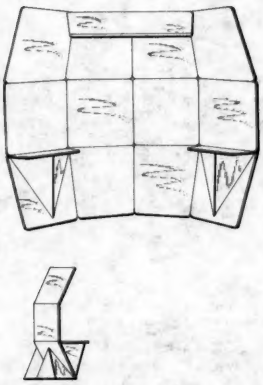
286,105
ADJUSTABLE ARMCHAIR
Paul R. Goldman, Andover, Mass., assignor to Plycraft Inc., Lawrence, Mass.
Filed Mar. 19, 1984, Ser. No. 590,983
Term of patent 14 years
U.S. Cl. D6—365

286,106
ARM-CHAIR
Klaus Franck, Hanover, and Werner Sauer, Wennigsen, both of Fed. Rep. of Germany, assignors to Wilkhahn Wilkening & Hahne GmbH & Co., Fed. Rep. of Germany
Continuation-in-part of Ser. No. 313,330, Oct. 20, 1981. This application Nov. 4, 1983, Ser. No. 548,822
Term of patent 14 years
U.S. Cl. D6—372

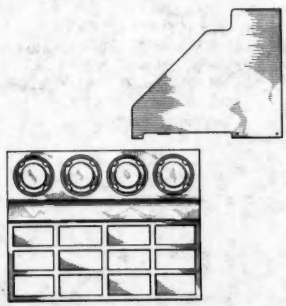
286,107
SUPPORT FOR FLOWER POTS
Gerardus F. Mens, Von Bonninghausenlaan 4, 2161 Et Lisse, Netherlands
Filed Feb. 7, 1985, Ser. No. 699,250
Claims priority, application Hague, Aug. 20, 1984, DM00410G
Term of patent 14 years
U.S. Cl. D6—404



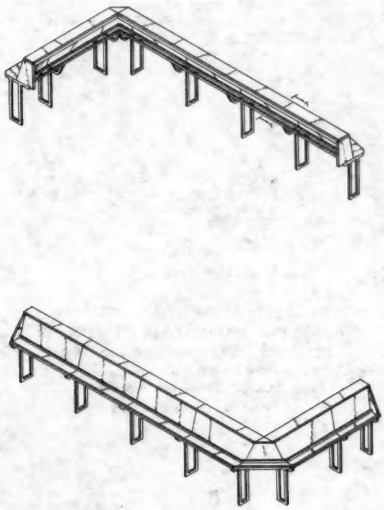
286,108
DISPLAY STAND
Albert W. Hanlon, Treasure Island, Fla., assignor to Folio Inc., Worcester, Mass.
Filed May 25, 1984, Ser. No. 614,057
Term of patent 14 years
U.S. Cl. D6—449



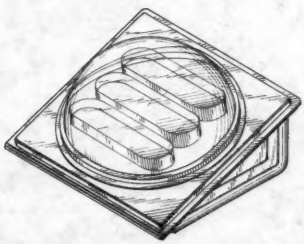
286,109
DISPENSER FOR CUPS AND PACKAGED MATERIALS
Richard M. Cosby, La Canada, and David A. Lindsey, Garden Grove, both of Calif., assignors to Coffee Enterprises, Inc., Paramount, Calif.
Filed May 3, 1984, Ser. No. 606,615
Term of patent 14 years
U.S. Cl. D6—469



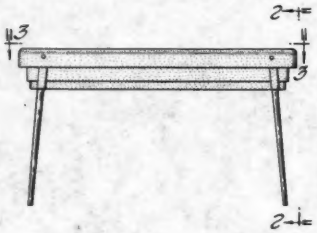
286,110
COUNTER DISPLAY UNIT
Thomas Carvel, Chauncey, N.Y., assignor to Carvel Corporation, Chauncy, N.Y.
Filed Dec. 29, 1982, Ser. No. 454,296
Term of patent 14 years
U.S. Cl. D6—471



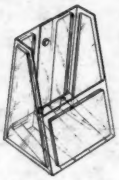
286,111
COMBINED DISPLAY AND STORAGE CASE FOR PENS AND THE LIKE
William C. Perchak, Chicago, Ill., assignor to Plastofilm Industries, Inc., Wheaton, Ill.
Filed Feb. 13, 1984, Ser. No. 579,373
Term of patent 14 years
U.S. Cl. D6—472



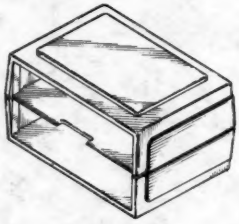
286,112
FOLDING, REFRIGERATED SERVING TABLE
Jesse K. Simmons, 4030 Sleeth Rd., Milford, Mich. 48042
Filed Mar. 5, 1984, Ser. No. 586,081
Term of patent 14 years
U.S. Cl. D6—475



286,113
HOLDER FOR PAMPHLETS OR THE LIKE
Lewis L. Albery, Delton, Ill., assignor to The Cooperative Marketing Co., Elk Grove Village, Ill.
Filed Apr. 12, 1984, Ser. No. 599,708
Term of patent 14 years
U.S. Cl. D6—475

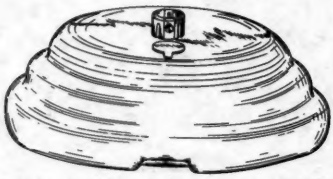


286,114
DIRECTORY SHELF
James M. Bosland, Wayne, N.J., assignor to Ketcham & McDougall, Inc., Roseland, N.J.
Filed May 10, 1984, Ser. No. 608,732
Term of patent 14 years
U.S. Cl. D6—477

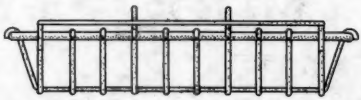


286,115
SHELF UNIT
Paul R. Evans, New Hope, Pa., assignor to Design Institute America, Inc., Montpelier, Ohio
Filed Apr. 10, 1984, Ser. No. 598,823
Term of patent 14 years
U.S. Cl. D6—478

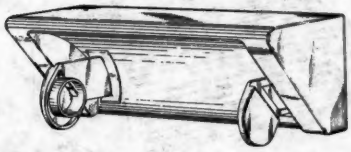
286,116
BASE FOR A GARDEN UMBRELLA
Joseph F. Tegze, Totowa, N.J., assignor to Finkel Outdoor Products, Inc., New York, N.Y.
Filed Jan. 16, 1984, Ser. No. 571,110
Term of patent 14 years
U.S. Cl. D6—495



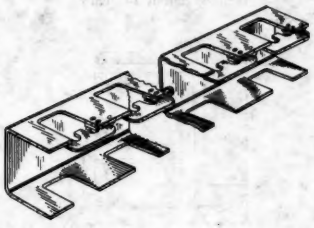
286,117
DETACHABLE TRAY
Richard C. Wellington, Woodcliff Lake, N.J., assignor to Wellington Home Products, Paterson, N.J.
Division of Ser. No. 544,220, Oct. 21, 1983. This application Sep. 13, 1985, Ser. No. 775,721
Term of patent 14 years
U.S. Cl. D6—500



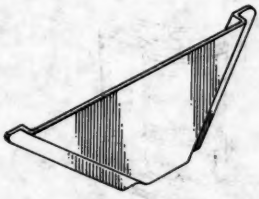
286,118
COMBINED PAPER TOWEL HOLDER AND SHELF
Bruno Gecchelin, Milan, Italy, assignor to Fratelli Guzzini S.p.A., Recanati, Italy
Filed Jun. 26, 1984, Ser. No. 624,764
Claims priority, application Italy, Dec. 29, 1983, 24058B/83
Term of patent 14 years
U.S. Cl. D6—519



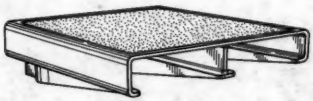
286,119
SKI RACK
Harold Enquist, 540 E. Kings Road, North Vancouver, British Columbia, Canada (V7N 1J3)
Filed Jul. 30, 1984, Ser. No. 635,724
Term of patent 14 years
U.S. Cl. D6—552



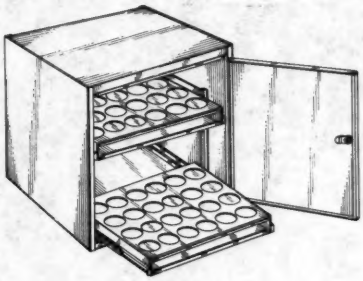
286,120
STORAGE RACK FOR FLOPPY DISKS
Michael J. Szablak, and Glen E. Tomblin, both of Winchester, Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Jan. 16, 1984, Ser. No. 570,896
Term of patent 14 years
U.S. Cl. D6—553



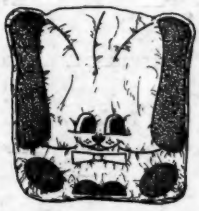
286,121
RACK FOR STORAGE CONTAINERS
Martin J. Wolff, No. Providence, R.I., assignor to Dart Industries Inc, Northbrook, Ill.
Filed Jan. 6, 1984, Ser. No. 568,670
Term of patent 14 years
U.S. Cl. D6—553



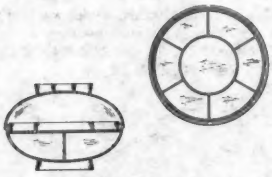
286,122
AEROSOL CAN DISPLAY CABINET
Bernard J. Golias, Parma Heights, Ohio, assignor to Metal Fabricating Corporation, Cleveland, Ohio
Filed Apr. 27, 1984, Ser. No. 604,928
Term of patent 14 years
U.S. Cl. D6—559



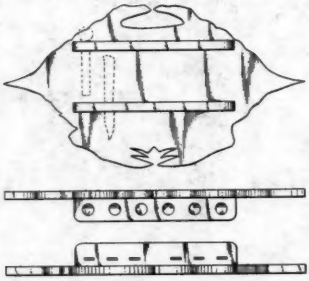
286,123
RUG OR SIMILAR ARTICLE
Michael W. Thomas, and Patricia J. Thomas, both of 23 Blaxland Avenue, Two Rocks, Western Australia, Australia
Filed Jul. 15, 1983, Ser. No. 514,333
Term of patent 14 years
U.S. Cl. D6—589



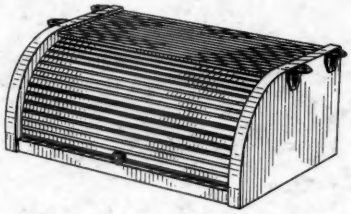
286,124
LAZY SUSAN WITH REFRIGERATED COMPARTMENT
Lavell D. Dempsey, 270 Donella Dr., San Antonio, Tex. 78232
Filed Jul. 9, 1984, Ser. No. 629,078
Term of patent 14 years
U.S. Cl. D7—2



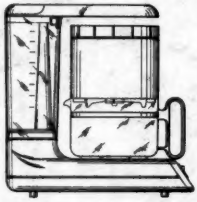
286,125
RACK FOR CRAB UTENSILS
John I. Simpson, Jr. deceased, late of Owings, Md., and by Mary E. Simpson, executrix, P.O. Box 257, Owings, Md. 20736
Filed Jul. 13, 1984, Ser. No. 630,881
Term of patent 14 years
U.S. Cl. D7—74

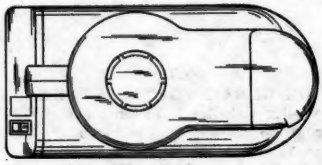


286,126
BREAD BOX
Paul J. Driscoll, Springfield, Mo., assignor to W. R. Vermillion Co., Inc., Springfield, Mo.
Filed Nov. 16, 1984, Ser. No. 671,945
Term of patent 14 years
U.S. Cl. D7—82



286,127
ELECTRIC COFFEE-MAKER
Roger Sastre, Dijon, France, assignor to SEB, Selongey, France
Filed Feb. 14, 1984, Ser. No. 580,547
Claims priority, application France, Aug. 18, 1983, 833067
Term of patent 14 years
U.S. Cl. D7—309





286,128

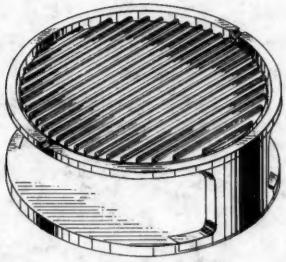
COMBINED ROASTING RACK AND TURNTABLE FOR MICROWAVE OVEN

Robert F. Bowen, Burlington, Mass.; Walter B. Herbst, Evanston, and Thomas E. Salisbury, Highland Park, both of Ill., assignors to Raytheon Company, Lexington, Mass.

Filed May 17, 1984, Ser. No. 611,229

Term of patent 14 years

U.S. Cl. D7—351



286,129

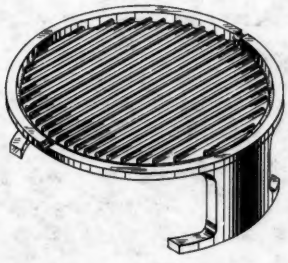
MICROWAVE ROASTING RACK OR THE LIKE

Robert F. Bowen, Burlington, Mass.; Walter B. Herbst, Evanston, and Thomas E. Salisbury, Highland Park, both of Ill., assignors to Raytheon Company, Lexington, Mass.

Filed May 17, 1984, Ser. No. 611,230

Term of patent 14 years

U.S. Cl. D7—351



286,130

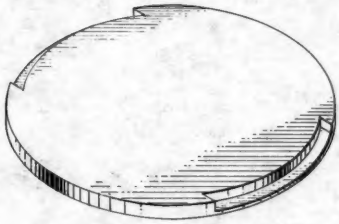
TURNTABLE FOR MICROWAVE OVEN

Robert F. Bowen, Burlington, Mass.; Walter B. Herbst, Evanston, and Thomas E. Salisbury, Highland Park, both of Ill., assignors to Raytheon Company, Lexington, Mass.

Filed May 17, 1984, Ser. No. 611,231

Term of patent 14 years

U.S. Cl. D7—351



286,131

ROUTER

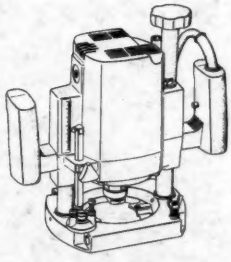
Etsushi Yamamoto, Fuchu, Japan, assignor to Ryobi Limited, Fuchu, Japan

Filed May 3, 1984, Ser. No. 606,767

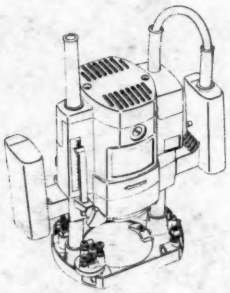
Claims priority, application Japan, Nov. 25, 1983, 58-51380

Term of patent 14 years

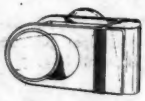
U.S. Cl. D8—67

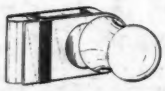


286,132
ROUTER
Etsushi Yamamoto, Fuchu, Japan, assignor to Ryobi Limited, Fuchu, Japan
Filed May 3, 1984, Ser. No. 606,768
Claims priority, application Japan, Nov. 25, 1983, 58-51381
Term of patent 14 years
U.S. Cl. D8—67

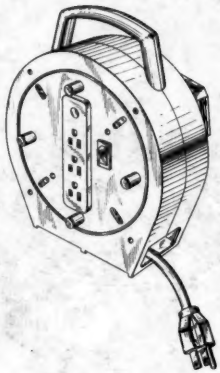


286,133
LAVATORY CUBICLE DOOR SLIDING BOLT
Ian H. Dryburgh, London, and Peter N. G. Murdoch, Milland, both of England, assignors to Venesta International Components Limited, Erith, England
Filed Nov. 20, 1984, Ser. No. 673,361
Claims priority, application United Kingdom, May 30, 1984, 8419198l
Term of patent 14 years
U.S. Cl. D8—341

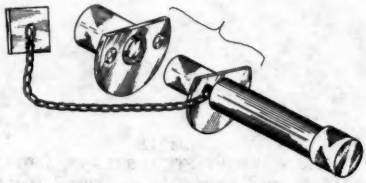




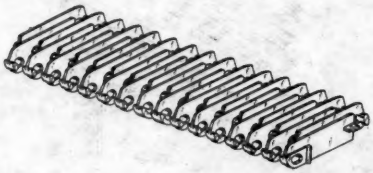
286,134
CORD REEL WITH INTEGRAL LIGHT
Frederic W. Schwartz, Providence, R.I., assignor to Cable Electric Products, Inc., Providence, R.I.
Filed Oct. 25, 1983, Ser. No. 543,816
Term of patent 14 years
U.S. Cl. D8—358



286,135
COMBINED DOOR STOP AND RECEPTACLE UNIT
John W. Looney, 228 Finley Dr., Decatur, Ala. 35601
Continuation-in-part of Ser. No. 491,371, May 3, 1988. This application Sep. 17, 1984, Ser. No. 651,287
Term of patent 14 years
U.S. Cl. D8—402



286,136
CHAIN LINK
Roger H. Schroeder, Hartland, and Wmyly G. Hodlewsky, Greendale, both of Wis., assignors to Rexnord Inc., Brookfield, Wis.
Filed Feb. 9, 1984, Ser. No. 578,341
Term of patent 14 years
U.S. Cl. D8—499



286,137

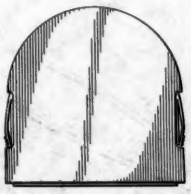
COMBINED PILL DISPENSER AND COVER

Charles M. Huck, Pottersville, N.J.; Edward J. Johnson, Furlong, Pa., and Jeremiah A. Lott, Westfield, N.J., assignors to Pfizer Inc., New York, N.Y.

Filed Apr. 5, 1984, Ser. No. 596,884

Term of patent 14 years

U.S. Cl. D9—339



286,138

TRAY FOR A GARDEN WATERING SET

Jack L. Lemkin, Cincinnati; Eugene A. Zilber, and Carl A. Peterson, both of Columbus, all of Ohio, assignors to The O.M. Scott & Sons Company, Marysville, Ohio

Filed Apr. 8, 1983, Ser. No. 483,151

Term of patent 14 years

U.S. Cl. D9—341

286,139

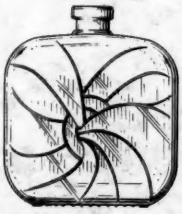
PERFUME BOTTLE

J. Michael O'Reilly, Brooklyn, N.Y., assignor to Revlon, Inc., New York, N.Y.

Filed May 17, 1984, Ser. No. 611,259

Term of patent 14 years

U.S. Cl. D9—370



286,140

BLISTER PACKAGE FOR A SQUARE REEL

George E. Kodousek, Milwaukee, and Lawrence S. Greco, Mequon, both of Wis., assignors to North American Philips Corporation, New York, N.Y.

Filed Nov. 3, 1983, Ser. No. 548,393

Term of patent 14 years

U.S. Cl. D9—418

286,141

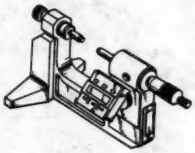
MICROMETER

Tamenori Shirai, Kure, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Jan. 10, 1984, Ser. No. 569,631

Term of patent 14 years

U.S. Cl. D10—73



286,142

TENSION INDICATOR FOR STRAP TENSIONERS

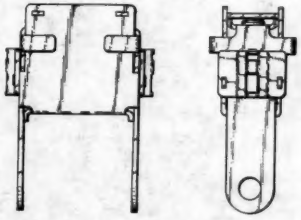
Peter Földi, Forsheda, and Hans Carselid, Anderstorp, both of Sweden, assignors to Broderna Holmbergs Fabriks AB, Anderstorp, Sweden

Filed Dec. 13, 1983, Ser. No. 560,824

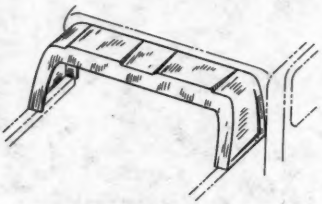
Claims priority, application Sweden, Jun. 13, 1983, 831609

Term of patent 14 years

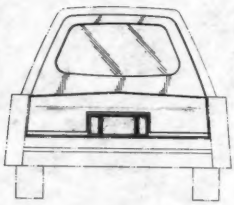
U.S. Cl. D10—83



286,143
AIR SPOILER FOR PICKUP TRUCKS
James R. Lund, Minneapolis, Minn., assignor to Lund Industries, Inc., Minneapolis, Minn.
Filed Sep. 2, 1983, Ser. No. 528,803
Term of patent 14 years
U.S. Cl. D12—181

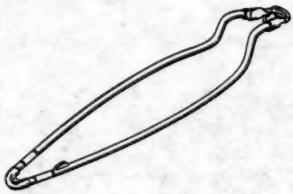


286,144
TWO PIECE DOOR UNIT FOR A VEHICLE
William N. Breece, 8 Ridge Drive Lake, Dallas, Tex. 75065
Filed Jan. 26, 1984, Ser. No. 574,068
Term of patent 14 years
U.S. Cl. D12—196

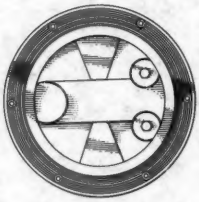


286,145
WHEEL
Ulf A. Sandberg, Kungsbacka, Sweden, assignor to Aktiebolaget Volvo, Goteborg, Sweden
Filed Jun. 19, 1984, Ser. No. 622,283
Term of patent 14 years
U.S. Cl. D12—211

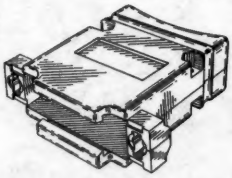
286,146
SAILBOARD BOOM
Graeme S. Attey, 61 Thelma Street, Como 6152, Western Australia, Australia
Filed Aug. 13, 1984, Ser. No. 640,101
Claims priority, application Australia, Feb. 14, 1984, 6514/84
Term of patent 14 years
U.S. Cl. D12—317



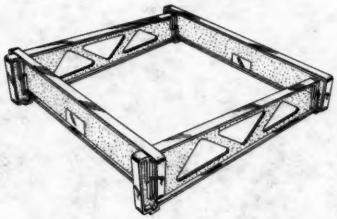
286,147
DECK PLATE
John A. Carlson, 1630 W. Cowles, Long Beach, Calif. 90813
Filed Feb. 13, 1984, Ser. No. 579,354
Term of patent 14 years
U.S. Cl. D12—317



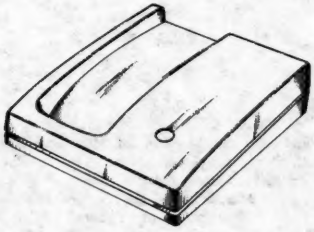
286,148
ELECTRICAL CONNECTOR COVER
Robert G. Dickie, Keswick, Canada, assignor to Northern Technologies Ltd., Markham, Canada
Filed Jan. 30, 1984, Ser. No. 575,214
Term of patent 14 years
U.S. Cl. D13—24

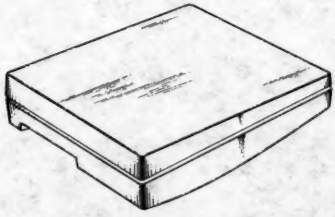


286,149
SPEAKER STAND
Robert Tucker, 2428 Canyon Dr., Hollywood, Calif. 90068
Filed May 24, 1984, Ser. No. 613,406
Term of patent 14 years
U.S. Cl. D14—38

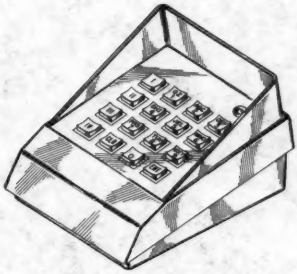


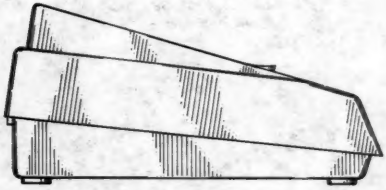
286,150
TELEPHONE INSTRUMENT BASE
Kenneth R. Cooke, New York, and Vito L. Porcelli, Ossining, both of N.Y., assignors to AT&T Technologies, Inc., New York, N.Y.
Division of Ser. No. 570,944, Jan. 16, 1984, Pat. No. Des. 271,571. This application Aug. 10, 1984, Ser. No. 702,970
Term of patent 14 years
U.S. Cl. D14—60



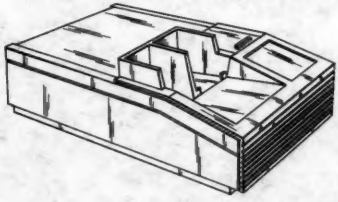


286,151
TELEPHONE SYSTEM KEYPAD ATTACHMENT STAND OR SIMILAR ARTICLE
Jeffrey A. Skigen, Vienna, and James C. P. Lum, Herndon, both of Va., assignors to GTE Telenet Communications Corporation, Reston, Va.
Filed Nov. 30, 1984, Ser. No. 677,008
Term of patent 14 years
U.S. Cl. D14—60

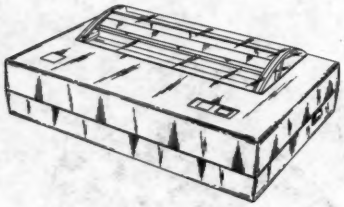




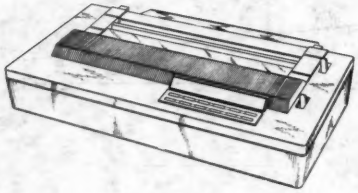
286,152
MICRO-FLOPPY DISK COPIER MACHINE
James A. Norton, Orange; Brent W. Murray, El Toro, and Charles M. Smith, Manhattan Beach, all of Calif., assignors to Media Systems Technology, Inc., Irvine, Calif.
Filed Nov. 25, 1983, Ser. No. 554,956
Term of patent 14 years
U.S. Cl. D14—107



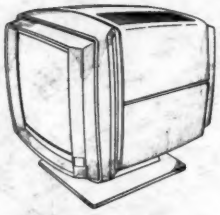
286,153
PRINTER
Myron F. Davis, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 7, 1983, Ser. No. 529,903
Term of patent 14 years
U.S. Cl. D14—111



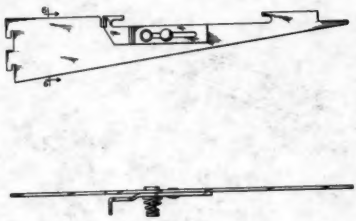
286,154
PRINTER CONSOLE
William G. Moggridge; Stephen R. Hobson, both of Palo Alto; Eric E. May, Los Altos, and Michael T. Sherick, Thousand Oaks, all of Calif., assignors to Advanced Matrix Technology, Inc., Newbury Park, Calif.
Filed Jan. 23, 1984, Ser. No. 572,811
Term of patent 14 years
U.S. Cl. D14—111



286,155
VIDEO DISPLAY TERMINAL
Can I. Gundogan, Bostos, Mass., assignor to Data General Corporation, Westboro, Mass.
Filed Jul. 18, 1983, Ser. No. 514,747
Term of patent 14 years
U.S. Cl. D14—113

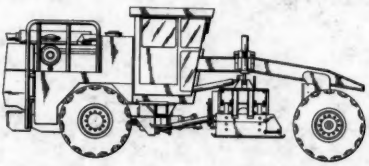


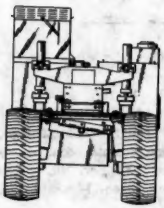
286,156
ADJUSTABLE SHELVING BRACKET
Arthur R. Mastrodicasa, 5 Elmcrest Cir., Walpole, Mass. 02081
Filed Mar. 26, 1984, Ser. No. 593,664
Term of patent 14 years
U.S. Cl. D8—381



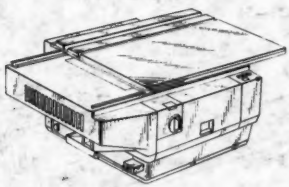
286,157
OUTBOARD ENGINE
Yoshio Mikado, Saitama; Jun Ito, and Masayuki Ohsumi, both of Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 30, 1984, Ser. No. 595,152
Term of patent 14 years
U.S. Cl. D15—4

286,158
ROAD PLANER
Donald C. Baldwin, Galion; Robert E. Loy, Bucyrus, both of Ohio, and Paul E. Willis, Orrstown, Pa., assignors to Dresser Industries, Inc., Dallas, Tex.
Filed Aug. 3, 1983, Ser. No. 519,808
Term of patent 14 years
U.S. Cl. D15—23



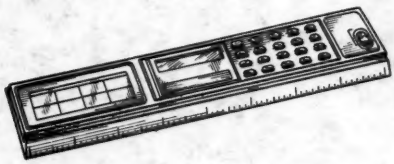


286,159
ELECTROPHOTOGRAPHIC COPIER
Nobuo Masaki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 2, 1984, Ser. No. 626,988
Claims priority, application Japan, Jan. 7, 1984, 59-126
Term of patent 14 years
U.S. Cl. D16—31

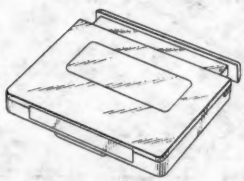


286,160
EYEGLASS FRAME
Ulrich J. Haas, Vienna, Austria, assignor to Optyl Eyewear Fashion International Corporation, Norwood, N.J.
Filed Jul. 30, 1984, Ser. No. 635,666
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1984, 11 AR 896/84
Term of patent 14 years
U.S. Cl. D16—117

286,161
COMBINED RULER, CALCULATOR AND CLOCK
Chambers Wong, Kowloon, Japan, assignor to Far East United Electronics Limited, Kowloon, Hong Kong
Filed Apr. 10, 1984, Ser. No. 598,834
Claims priority, application United Kingdom, Oct. 12, 1983, 1015630
Term of patent 14 years
U.S. Cl. D18—2



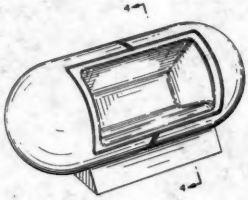
286,162
TYPE STYLE CARTRIDGE FOR TYPEWRITER
Richard Nibley, and Norinki Haranishi, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 18, 1984, Ser. No. 683,216
Claims priority, application Japan, Jul. 6, 1984, 59-28032
Term of patent 14 years
U.S. Cl. D18—12



286,163
PEN
Koichi Shintani, Tokyo, Japan, assignor to Colleen Pencil Co., Ltd., Tokyo, Japan
Filed Jan. 10, 1983, Ser. No. 456,760
Claims priority, application Japan, Dec. 3, 1982, 57-54091
Term of patent 14 years
U.S. Cl. D19—43

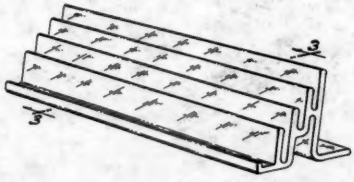
286,164
WRITING PEN
Bernhard H. Tinz, Stuttgart, Fed. Rep. of Germany, assignor to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.
Filed Jun. 19, 1984, Ser. No. 622,318
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1983, 66 MR 11758
Term of patent 14 years
U.S. Cl. D19—48

286,165
DESK TIDY
James Rooney, Luton, England, assignor to Alternate Resources Limited, Bedfordshire, England
Filed Mar. 12, 1984, Ser. No. 588,554
Claims priority, application United Kingdom, Sep. 15, 1983, 1015115
Term of patent 14 years
U.S. Cl. D19—75



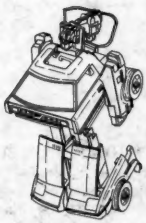
286,166
PRICE TAG LABEL STRIP
David B. Russell, Southborough, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.
Filed Jul. 30, 1982, Ser. No. 403,881
Term of patent 14 years
U.S. Cl. D20—22

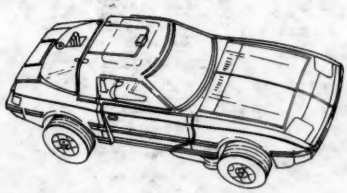
286,167
TIERED CARD HOLDER
Morris Greitzer, 3057 Earlmar Dr., Los Angeles, Calif. 90064
Filed Aug. 30, 1984, Ser. No. 645,785
Term of patent 14 years
U.S. Cl. D21—54



286,168
TOY CONSTRUCTION PIECE
Giuseppe Mazzoleni, Valle S. Bartolomeo, Italy, assignor to Creative S.r.l., Italy
Filed May 25, 1984, Ser. No. 613,990
Claims priority, application Italy, Dec. 1, 1983, 54003/83[U]
Term of patent 14 years
U.S. Cl. D21—108

286,169
RECONFIGURABLE TOY VEHICLE
Kouzin Ohno, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed May 30, 1984, Ser. No. 616,595
Claims priority, application Japan, Dec. 30, 1983, 58-57471
Term of patent 14 years
U.S. Cl. D21—136

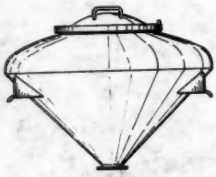


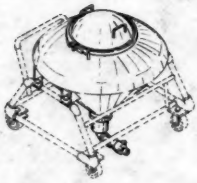


286,170
EXERCISER
Jacqueline P. Colleuil, 7, Boulevard Joseph Garnier, 06100 Nice, France
Filed Mar. 21, 1984, Ser. No. 591,690
Claims priority, application Hague, Nov. 2, 1983, DM/003048
Term of patent 14 years
U.S. Cl. D21—191

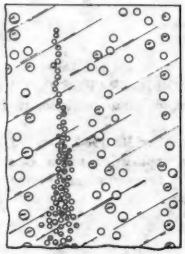
286,171
FABRIC HOLSTER
Richard D. E. Nichols, Fallbrook, Calif., assignor to Bianchi International, Temecula, Calif.
Filed Jan. 30, 1984, Ser. No. 575,308
Term of patent 14 years
U.S. Cl. D3—101

286,172
TANK FOR PHARMACEUTICAL MANUFACTURING PROCESSING
Yorinobu Takino, Osaka, Japan, assignor to Matsui Manufacturing Co., Limited, Osaka, Japan
Filed Sep. 13, 1983, Ser. No. 531,769
Term of patent 14 years
U.S. Cl. D23—2

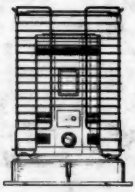




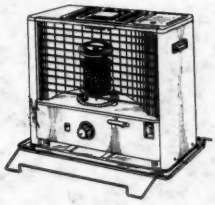
286,173
PANEL FOR A SHOWER PARTITION
Heinz G. Baus, Warthodenstr. 35, CH 3626 Hünibach/Thun, Switzerland
Filed Mar. 26, 1982, Ser. No. 362,127
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1981, URA 1011/81
Term of patent 14 years
U.S. Cl. D23—64



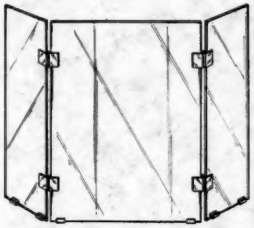
286,174
OIL-FIRED SPACE HEATER OR SIMILAR ARTICLE
Kazuharu Nakamura, Nagoya, Japan, assignor to Toyotomi Kogyo Co., Ltd., Aichi, Japan
Filed Jul. 19, 1984, Ser. No. 632,305
Claims priority, application Japan, Jan. 24, 1984, 59-2118
Term of patent 14 years
U.S. Cl. D23—122



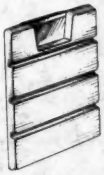
286,175
OIL STOVE
Kunio Takahashi, Kamo, Japan, assignor to Uchida Manufacturing Co. Ltd., Nugata, Japan
Filed Feb. 25, 1983, Ser. No. 469,910
Term of patent 14 years
U.S. Cl. D23—122



286,176
FIREPLACE SCREEN
Joseph J. Catania, Cheshire; Angelo Gaudino, Wallingford; Russell DeTuzzi, Huntington, and Maxwell Gardner, Wallingford, all of Conn., assignors to Century Fireplace Furnishings, Inc., Wallingford, Conn.
Filed Jun. 11, 1984, Ser. No. 619,050
Term of patent 14 years
U.S. Cl. D23—138.3

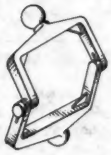


286,177
CABINET DOOR
Robert Case, Chicago, Ill.; Arden Jenkins; Randall N. Bartlett, both of Bay Minette, Ala., and Ernest Petrick, Mobile, Ala., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.
Filed Jul. 18, 1983, Ser. No. 515,003
Term of patent 14 years
U.S. Cl. D24—5

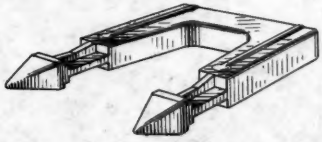


286,178
ALEMBIC
Robert Geissmann, 153 rue de l'Universite, 75007 Paris, France
Filed Mar. 3, 1983, Ser. No. 471,796
Claims priority, application France, Oct. 15, 1982, 82 3540
Term of patent 14 years
U.S. Cl. D24—8

286,179
DENTAL ARTICULATOR WITH A BALL MOUNTING
Ronald E. Huffman, Tucson, Ariz., assignor to Kv33 Corporation, Tucson, Ariz.
Filed Mar. 14, 1983, Ser. No. 475,135
Term of patent 14 years
U.S. Cl. D24—10

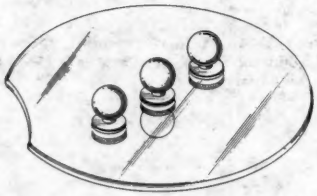


286,180
SURGICAL FASTENER
Herbert W. Korthoff, Wilton, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.
Filed Oct. 16, 1984, Ser. No. 662,972
Term of patent 14 years
U.S. Cl. D24—27

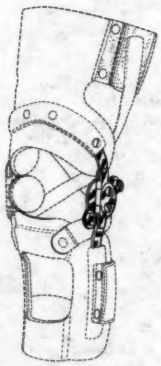


286,181
ACETABULAR CUP ASSEMBLY PROSTHESIS
Robert V. Kenna, Hackensack, N.J., assignor to Pfizer Hospital Products Group, Inc., New York, N.Y.
Filed Aug. 26, 1983, Ser. No. 526,729
Term of patent 14 years
U.S. Cl. D24—33

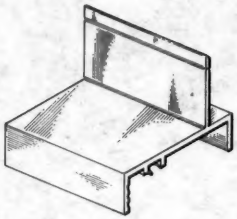
286,182
COMBINED MASSAGE AND ACUPRESSURE DISC
Robert S. Hilman, J1. Krekot Dalam/Krekot Bunder 4, Proyek "Jaya Molek" H-17, Jakarta, Indonesia
Filed Feb. 1, 1984, Ser. No. 575,777
Term of patent 14 years
U.S. Cl. D24—36



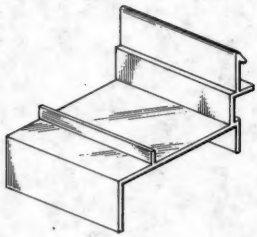
286,183
ADJUSTABLE JOINT FOR A KNEE BRACE
Darryl L. Womack, Lakewood; Ralph B. Noell, Denver, and Larry R. Bradshaw, Arvada, all of Colo., assignors to Scott Orthopedics, Inc., Denver, Colo.
Filed Jun. 4, 1984, Ser. No. 616,978
Term of patent 14 years
U.S. Cl. D24—64



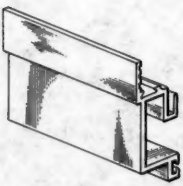
286,184
FRAME HEAD EXTRUSION
Joseph C. Bancroft, 812 Sweetwater Club Blvd., Longwood, Fla. 32779
Filed Nov. 30, 1983, Ser. No. 556,361
The portion of the term of this patent subsequent to Oct. 14, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D25—74



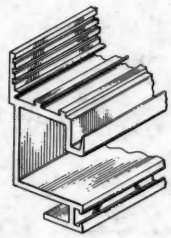
286,185
FRAME SILL EXTRUSION
Joseph C. Bancroft, 812 Sweetwater Club Blvd., Longwood, Fla. 32779
Filed Nov. 30, 1983, Ser. No. 556,363
The portion of the term of this patent subsequent to Oct. 14, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D25—74



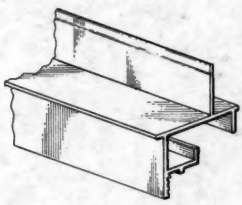
286,186
MEETING RAIL EXTRUSION
Joseph C. Bancroft, 812 Sweetwater Club Blvd., Longwood, Fla. 32779
Filed Nov. 30, 1983, Ser. No. 556,365
The portion of the term of this patent subsequent to Oct. 14, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D25—74



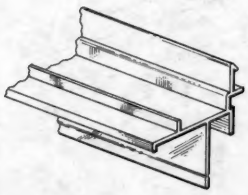
286,187
MEETING RAIL EXTRUSION
Joseph C. Bancroft, 812 Sweetwater Club Blvd., Longwood, Fla. 32779
Filed Apr. 5, 1985, Ser. No. 720,616
The portion of the term of this patent subsequent to Oct. 14, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D25—74



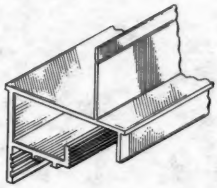
286,188
FRAME JAMB EXTRUSION
Joseph C. Bancroft, 812 Sweetwater Club Blvd., Longwood, Fla. 32779
Filed Apr. 5, 1985, Ser. No. 720,618
The portion of the term of this patent subsequent to Oct. 14, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D25—74



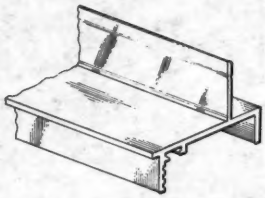
286,189
FRAME SILL EXTRUSION
Joseph C. Bancroft, 812 Sweetwater Club Blvd., Longwood, Fla. 32779
Filed Apr. 5, 1985, Ser. No. 720,621
The portion of the term of this patent subsequent to Oct. 14, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D25—74



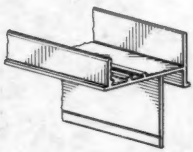
286,190
FRAME JAMB EXTRUSION
Joseph C. Bancroft, 812 Sweetwater Club Blvd., Longwood, Fla. 32779
Filed Apr. 5, 1985, Ser. No. 720,622
The portion of the term of this patent subsequent to Oct. 14, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D25—74



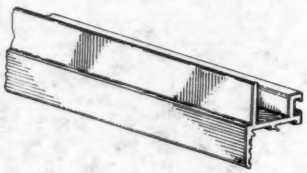
286,191
FRAME HEAD-FIN EXTRUSION
Joseph C. Bancroft, 812 Sweetwater Club Blvd., Longwood, Fla. 32779
Filed Apr. 11, 1985, Ser. No. 721,884
The portion of the term of this patent subsequent to Oct. 14, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D25—74



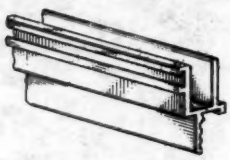
286,192
FIXED JAMB
Joseph C. Bancroft, 812 Sweetwater Club Blvd., Longwood, Fla. 32779
Filed Aug. 2, 1985, Ser. No. 761,815
The portion of the term of this patent subsequent to Oct. 7, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D25—74



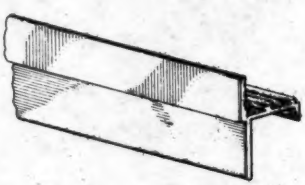
286,193
FRAME INSERT - HEAD
Joseph C. Bancroft, 812 Sweetwater Club Blvd., Longwood, Fla. 32779
Filed Aug. 2, 1985, Ser. No. 761,816
The portion of the term of this patent subsequent to Oct. 14, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D25—74



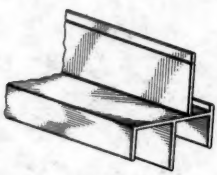
286,194
VENT HEAD AND SILL
Joseph C. Bancroft, 812 Sweetwater Club Blvd., Longwood, Fla. 32779
Filed Aug. 2, 1985, Ser. No. 761,819
The portion of the term of this patent subsequent to Oct. 7, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D25—74



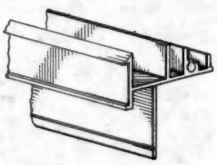
286,195
FRAME INSERT SILL
Joseph C. Bancroft, 812 Sweetwater Club Blvd., Longwood, Fla. 32779
Filed Aug. 2, 1985, Ser. No. 761,821
The portion of the term of this patent subsequent to Oct. 14, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D25—74



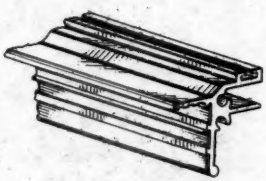
286,196
FRAME HEAD
Joseph C. Bancroft, 812 Sweetwater Club Blvd., Longwood, Fla. 32779
Filed Aug. 2, 1985, Ser. No. 761,849
The portion of the term of this patent subsequent to Oct. 7, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D25—74



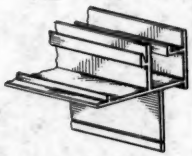
286,197
LATCH JAMB
Joseph C. Bancroft, 812 Sweetwater Club Blvd., Longwood, Fla. 32779
Filed Aug. 2, 1985, Ser. No. 761,850
The portion of the term of this patent subsequent to Oct. 14, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D25—74



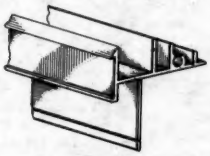
286,198
VENT LATCH JAMB
Joseph C. Bancroft, 812 Sweetwater Club Blvd., Longwood, Fla. 32779
Filed Aug. 2, 1985, Ser. No. 761,767
The portion of the term of this patent subsequent to Oct. 14, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D25—74



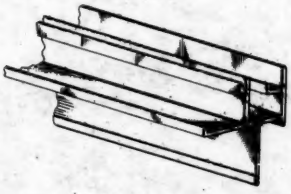
286,199
FRAME SILL STANDARD
Joseph C. Bancroft, 812 Sweetwater Club Blvd., Longwood, Fla. 32779
Filed Aug. 2, 1985, Ser. No. 761,768
The portion of the term of this patent subsequent to Oct. 14, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D25—74



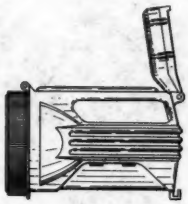
286,200
FRAME LATCH JAMB
Joseph C. Bancroft, 812 Sweetwater Club Blvd., Longwood, Fla. 32779
Filed Aug. 2, 1985, Ser. No. 761,769
The portion of the term of this patent subsequent to Oct. 14, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D25—74



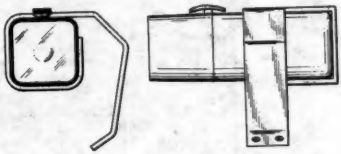
286,201
FRAME SILL
Joseph C. Bancroft, 812 Sweetwater Club Blvd., Longwood, Fla. 32779
Filed Aug. 2, 1985, Ser. No. 761,877
The portion of the term of this patent subsequent to Oct. 14, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D25—74



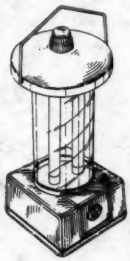
286,202
COMBINED SPOTLIGHT AND RADIO
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Jul. 11, 1984, Ser. No. 629,796
Claims priority, application United Kingdom, Jan. 19, 1984, 1017422
Term of patent 14 years
U.S. Cl. D26—38



286,203
COMBINED HEAD LAMP AND MOUNTING BRACKET FOR FIREMAN'S HELMET
Stephen A. Crane; Howard A. Crane; Douglas A. Crane, and Timothy J. Crane, all of Monroe County, N.Y., assignors to Crane Manufacturing & Plastics Corp., Fairport, N.Y.
Filed Apr. 6, 1983, Ser. No. 482,402
Term of patent 14 years
U.S. Cl. D26—39



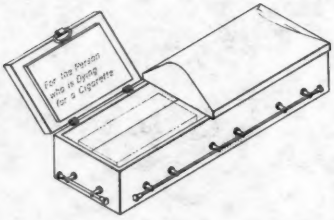
286,204
LANTERN
Tit-Wing Poon, Hong Kong, Hong Kong, assignor to Flying Dragon Metal Products Factory, Chaiwan, Hong Kong
Filed Jun. 14, 1983, Ser. No. 504,194
The portion of the term of this patent subsequent to Sep. 23, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—42



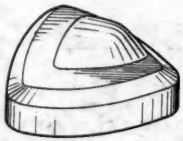
286,205
LIGHTING FIXTURE
Michael T. Jankowski, Leek, and Hans T. Meelen, Geldrop, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed May 11, 1984, Ser. No. 609,245
Claims priority, application Benelux, Nov. 17, 1983, 58433-03
Term of patent 14 years
U.S. Cl. D26—65

286,206
LIGHTING FIXTURE
Stefanus F. W. Joosten, and Evert Oosterheerd, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 13, 1984, Ser. No. 579,638
Claims priority, application Benelux, Aug. 25, 1983, 58173-04
Term of patent 14 years
U.S. Cl. D26—85

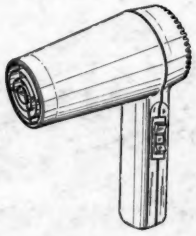
286,207
MINIATURE COFFIN CIGARETTE CASE
Joe E. Colliver, Rte. #3, Box 12B, Cleveland, Okla. 74020
Filed Feb. 13, 1984, Ser. No. 579,498
Term of patent 14 years
U.S. Cl. D27—50



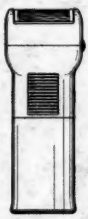
286,208
PHARMACEUTICAL TABLET
Geoffrey D. Tovey, Harpenden, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England
Filed Dec. 28, 1984, Ser. No. 687,316
Claims priority, application United Kingdom, Jul. 2, 1984, 1020678
The portion of the term of this patent subsequent to Oct. 7, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D28—2



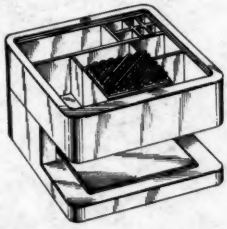
286,209
HAIR-DRYER
Murray I. C. Camens, Groningen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jul. 2, 1984, Ser. No. 626,955
Claims priority, application United Kingdom, Jan. 25, 1984, 1017516
Term of patent 14 years
U.S. Cl. D28—13



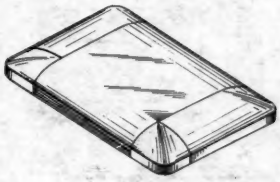
286,210
ELECTRIC SHAVER
Noboru Abe, Suita, Japan, and Florian Seiffert, Wiesbaden, Fed. Rep. of Germany, assignors to Matsushita Electric Works, Ltd., Osaka, Japan
Filed Jul. 5, 1984, Ser. No. 627,671
Claims priority, application Japan, Jan. 20, 1984, 59-1693
Term of patent 14 years
U.S. Cl. D28—49



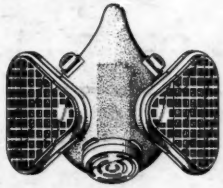
286,211
NAIL DRYER AND ORGANIZER
Benson Zinbarg, Stamford; Barbara A. Fortin, Norwalk, and Paul F. Siegel, Ridgefield, all of Conn., assignors to Sun Hill Industries, Inc., Stamford, Conn.
Filed Oct. 31, 1984, Ser. No. 666,894
Term of patent 14 years
U.S. Cl. D28—58



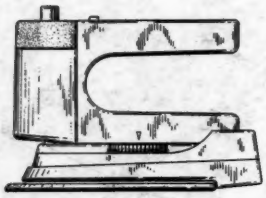
286,212
MULTICOMPARTMENT COMPACT
Ugo Campello; Enrico Racca, both of Miami, Fla.; Pierluigi Sosta, and Deris Baggiolini, both of Concesio, Italy, assignors to New High Glass, Miami, Fla.
Filed Nov. 14, 1984, Ser. No. 671,472
Term of patent 14 years
U.S. Cl. D28—83



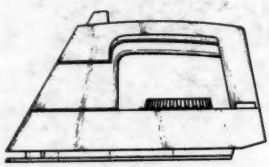
286,213
DUAL FILTER RESPIRATOR
Richard D. Maryyanek, 711 Highland Ct., Northbridge, Mass. 01534 and Joseph Z. Zdrok, 24 Tower St., Webster, Mass. 01570
Continuation-in-part of Ser. No. 439,948, Nov. 8, 1982. This application May 11, 1983, Ser. No. 493,649
Term of patent 14 years
U.S. Cl. D29—7



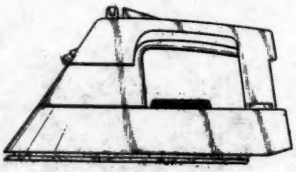
286,214
IRON
Bing Y. Chan, Kowloon, Hong Kong, assignor to Goodway Electrical Co., Ltd., Kowloon, Hong Kong
Filed Sep. 13, 1984, Ser. No. 650,065
Claims priority, application United Kingdom, Mar. 13, 1984, 1018473
Term of patent 14 years
U.S. Cl. D32—69



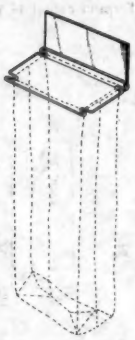
286,215
STEAM IRON
Robert Pataki, Clayton, Australia, assignor to Chiaphua Industries, Kowloon, Hong Kong
Filed May 7, 1984, Ser. No. 607,475
Claims priority, application United Kingdom, Jan. 20, 1984, 1017485
The portion of the term of this patent subsequent to Oct. 14, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D32—70



286,216
STEAM IRON
Robert Pataki, Clayton, Australia, assignor to Chiaphua Industries, Ltd., Kowloon, Hong Kong
Filed May 7, 1984, Ser. No. 607,469
Claims priority, application United Kingdom, Jan. 20, 1984, 1017484
The portion of the term of this patent subsequent to Oct. 14, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D32—70

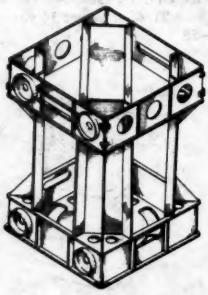


286,217
REFUSE BAG HOLDER
Robert G. Waun, Rte. 1, US 31 S., and Cathie Terrill, 113½ Eaton, both of Charlevoix, Mich. 49720
Filed Sep. 24, 1984, Ser. No. 653,590
Term of patent 14 years
U.S. Cl. D34—6



286,218
SHOPPING CART
Yechiel Friedman, 1331 48th St., Brooklyn, N.Y. 11219
Filed Oct. 1, 1984, Ser. No. 656,738
Term of patent 14 years
U.S. Cl. D34—17

286,219
BOTTLE CASE
Carl E. Frahm, 1428 Oak Meadow Rd., Arcadia, Calif. 91006
Filed Dec. 5, 1983, Ser. No. 557,849
Term of patent years
U.S. Cl. D34—43



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 14TH DAY OF OCTOBER, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Corporation: *See*—
Engstrom, Folke; Hakulin, Bertel K.; and Ruottu, Seppo K., 4,616,576, Cl. 110-345.000.

A. E. Staley Manufacturing Company: *See*—
Kiely, Donald E.; and Seidman, Martin, 4,617,405, Cl. 549-262.000.

AAA Steel and Enterprises Corp.: *See*—
Gross, Sol N., 4,616,417, Cl. 30-134.000.

AB Mataki: *See*—
Larsson, Leif; and Ekdahl, Bengt, 4,617,229, Cl. 428-284.000.

AB Volvo: *See*—
Kronogard, Sven-Olof; Kronogard, Clas-Olof; and Kronogard, Hakan, 4,616,482, Cl. 60-624.000.

Abbott, Eion A. Pop-up sprinkler. 4,616,780, Cl. 239-113.000.

Abe, Hitoshi: *See*—
Nagashima, Shigeo; Abe, Hitoshi; and Hatakeyama, Yasuhiko, 4,617,625, Cl. 364-200.000.

Abe, Katsuhiro: *See*—
Yano, Kazunori; Goto, Teruhisa; and Abe, Katsuhiro, 4,617,372, Cl. 528-216.000.

Abe, Kunihiro, to Fuji Jukogyo Kabushiki Kaisha. System for regulating the idle speed of an internal combustion engine. 4,616,614, Cl. 123-339.000.

Abe, Takao: *See*—
Hotta, Yuji; Abe, Takao; Ishii, Fumio; Kitamura, Shigehiro; Koshizuka, Kunihiro; and Nakamura, Masaki, 4,617,224, Cl. 428-212.000.

Abendroth, Carl W. Fastener for flooring systems. 4,616,462, Cl. 52-509.000.

ABG Semca: *See*—
Soum, Jacques; and Malabre, Christian, 4,616,388, Cl. 29-149.50S.

Abo, Keiju: *See*—
Tanaka, Yoshikazu; Kumura, Haruyoshi; Abo, Keiju; Yamamuro, Sigeaki; and Hirano, Hiroyuki, 4,616,530, Cl. 74-851.000.

Abrams, Jack Z.; and Sherwin, Robert M., to Empire State Electric Energy Research Corp. (ESEERCO). Process for treating combustion systems with pressure-hydrated dolomitic lime. 4,616,574, Cl. 110-343.000.

Adam Equipment Corp.: *See*—
Kopp, Walter, 4,616,990, Cl. 425-239.000.

Adams, Norman R.; and Gifford, Charles A., to Cooper Tire & Rubber Company. Two-way selector valve for a vehicle seat inflation device. 4,616,676, Cl. 137-636.400.

Adams, Truman W., to Anchors, Inc. Anchor retrieval mechanism. 4,616,589, Cl. 114-210.000.

Adley, James M.; and Chang, Phillip, to International Business Machines Corporation. Non-contact developer seal. 4,616,919, Cl. 355-3.0DD.

Adolfsson, Roger, to Cederroths AB. Means for wall boards. 4,616,755, Cl. 211-89.000.

Adolph Coors Company: *See*—
Vischer, Peter, 4,616,818, Cl. 271-113.000.

Advanced Cardiovascular Systems, Inc.: *See*—
Samson, Wilfred J.; and Frisbie, Jeffrey S., 4,616,653, Cl. 128-344.000.
Simpson, John B., 4,616,652, Cl. 128-344.000.

Advanced Micro Devices, Inc.: *See*—
Brown, Candice H., 4,616,406, Cl. 29-588.000.
Wang, Scott W.; Thomas, Mammen; and Ko, Wen C., 4,616,404, Cl. 29-576.00B.

AE PLC: *See*—
Slee, Roger H., 4,616,389, Cl. 29-156.40R.

AEPLC: *See*—
Baker, John C., 4,616,884, Cl. 384-7.000.

Aesculap-Werke Aktiengesellschaft: *See*—
Caspar, Wolfhard; Lutze, Theodor; and Schwarz, Theodor, 4,616,635, Cl. 128-20.000.

Afzali-Ardakani, Ali: *See*—
Sachdev, Krishna G.; Afzali-Ardakani, Ali; Pennington, Keith S.; and Cohen, Mitchell S., 4,617,579, Cl. 346-135.100.

Agfa Gevaert Aktiengesellschaft: *See*—
Kunitz, Friedrich-Wilhelm; and Schranz, Karl-Wilhelm, 4,617,256, Cl. 430-557.000.
Wolff, Erich; Langen, Hans; and Braden, Rudolf, 4,617,255, Cl. 430-553.000.

Agfa-Gevaert N.V.: *See*—
Boeve, Gerard J.; and De Cock, Etienne M., 4,616,821, Cl. 271-213.000.
Buelens, Edward; and Goossens, Carolus C., 4,616,914, Cl. 354-277.000.

AGILE Systems: *See*—
Dickerson, James W.; and Smith, William N., III, 4,617,423, Cl. 178-2.00R.

Agos, Angel, to Aryho, S.A. Simple or rotating traversers for vertical window blinds. 4,616,688, Cl. 160-176.00R.

Agway Inc.: *See*—
Nocek, James E., 4,617,276, Cl. 436-20.000.

Aichelmann, Frederick J., Jr.; and Lange, Lawrence K., to International Business Machines Corporation. Error correction for multiple bit output chips. 4,617,664, Cl. 371-38.000.

Aihara, Yoshihiko: *See*—
Someya, Hiromi; Aihara, Yoshihiko; Suzuki, Nobuyuki; and Mizogui, Toyokazu, 4,616,916, Cl. 354-442.000.

Air Products and Chemicals, Inc.: *See*—
Brown, William R.; Cassano, Anthony A.; Dunbobbin, Brian R.; Rao, Pradip; and Erickson, Donald C., 4,617,182, Cl. 423-579.000.
Ford, Michael E.; and Johnson, Thomas A., 4,617,418, Cl. 564-479.000.
Garg, Diwakar, 4,617,106, Cl. 208-418.000.
Miller, Robert N., 4,617,105, Cl. 208-412.000.
Pez, Guido P.; and Carlin, Richard T., 4,617,029, Cl. 55-16.000.
Suchdeo, Shyam R.; Patel, Suresh U.; and Harris, Christopher F., 4,617,036, Cl. 62-11.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Kodama, Hisashi; and Ono, Takuro, 4,616,607, Cl. 123-90.460.
Ogasawara, Tsunehiko; Arakawa, Yoshichika; Sumiya, Koji; and Sakaguchi, Yoshikazu, 4,616,531, Cl. 74-866.000.

Aisin Warner Kabushiki Kaisha: *See*—
Ogasawara, Tsunehiko; Arakawa, Yoshichika; Sumiya, Koji; and Sakaguchi, Yoshikazu, 4,616,531, Cl. 74-866.000.

Ajinomoto Co., Inc.: *See*—
Tanaka, Kiyoshi; Koga, Yoshihiro; Saeki, Masaru; Kaneko, Tetsuya; and Kawakita, Tetsuya, 4,617,155, Cl. 260-501.120.

Akachi, Yoshiaki; Kyoso, Yasuo; and Matsumaru, Takeo, to TDK Corporation. Coil bobbin. 4,617,543, Cl. 336-192.000.

Akagi, Yuji: *See*—
Hattori, Toshihiko; Akagi, Yuji; and Kohara, Hideo, 4,616,985, Cl. 418-173.000.

Akashi, Akira; and Yamada, Masanori, to Canon Kabushiki Kaisha. Automatic focusing device with low light contrast inhibiting means. 4,617,459, Cl. 250-201.000.

Akashi, Teruo; Ito, Hiroshi; and Yamada, Shigemichi, to Toyota Jidosha Kabushiki Kaisha. Transmission control method providing overlapped engagement of power transmission systems. 4,616,521, Cl. 74-335.000.

Akatsu, Yohsuke: *See*—
Sugasawa, Fukashi; Kuroki, Junsuke; and Akatsu, Yohsuke, 4,616,848, Cl. 280-707.000.

Akira, Takashima; Kobayashi, Masahiko; Nasu, Hitoo; Okida, Yoshishiro; and Tsuji, Kazuhiko, to Kubota, Ltd. Earth moving vehicle. 4,616,872, Cl. 296-190.000.

Albert, Alban; Courbat, Pierre; and Weith, Andre , to Ciba-Geigy Corporation. 3-O-acylated derivatives of (+)-cyanidan-3-ol. 4,617,296, Cl. 514-100.000.

Albert Rolland, S.A.: *See*—
Bessin, Pierre; and Bonnet, Jacqueline, 4,617,315, Cl. 514-427.000.

Albertini, Rocco D.; Clements, Ralph E.; and Grzeczkowski, Thomas V., to Baldt Incorporated. Acoustical mooring release system. 4,616,590, Cl. 114-230.000.

Albizzati, Enrico, to Montedison S.p.A. Catalyst components and catalysts for the polymerization of olefins. 4,617,285, Cl. 502-134.800.

Alcala, Robert, to American Hospital Supply Corporation. Disposable shoe cover. 4,616,429, Cl. 36-7.200.

Alcon Laboratories, Inc.: *See*—
Schafer, Doris; and Schafer, Rolf, 4,617,186, Cl. 424-78.000.

Aldenhoven, Ghislanus M. A. M., to U.S. Philips Corporation. Holder for a rigid information disc and loading-system comprising a loading mechanism adapted to cooperate with such a holder. 4,617,655, Cl. 369-291.000.

Alexander, Frederick D., to Ekco Products, Inc. Disposable cooking pan. 4,616,762, Cl. 220-74.000.

Alexoff, Randall L., to George A. Mitchell Company. Method for producing tubing of varying wall thickness. 4,616,500, Cl. 72-283.000.

Alfred Teves GmbH: *See*—
Kircher, Dieter; von Gruenberg, Hubertus; Blum, Klaus D.; and Becker, Peter, 4,616,727, Cl. 180-142.000.

Allied Corporation: *See*—
Becker, Larry W.; and Larson, Eric H., 4,617,362, Cl. 526-209.800.
Devensky, Walter L.; and Dube, Carlos M., 4,617,678, Cl. 375-102.000.
Gupta, Arunava; West, Gary A.; and Yardley, James T., 4,617,237, Cl. 428-446.000.
Light, William G., 4,617,127, Cl. 210-651.000.
Marshall, Robert M., 4,617,236, Cl. 428-391.000.

Allied Steel & Tractor Products, Inc.: *See*—
Bouplon, Edward J., 4,616,716, Cl. 173-49.000.
Alloy Surfaces Company, Inc.: *See*—
Baldi, Alfonso L., 4,617,202, Cl. 427-253.000.
Alps Electric Co., Ltd.: *See*—
Sone, Takehiko; Takoshima, Takehiro; and Kamijyo, Yoshimi, 4,617,487, Cl. 310-313.00D.
Tokunaga, Ichiro; Matsunaga, Hiroshi; and Shimojima, Yoji, 4,617,460, Cl. 250-227.000.
Alt, Anton: *See*—
Hornung, Klaus; Alt, Anton; Schulte, Gunter; and Mahnig, Fritz, 4,617,069, Cl. 148-138.000.
Altera Corporation: *See*—
Hartmann, Robert F.; Wong, Sau-Ching; Chan, Yiu-Fai; and Ou, Jung-Hsing, 4,617,479, Cl. 307-465.000.
Aluminium Pechiney: *See*—
Veyrier, Maurice, 4,617,179, Cl. 423-121.000.
Aluminum Company of America: *See*—
Boughton, Michael J., 4,617,100, Cl. 204-245.000.
Amano Seiyaku Kabushiki Kaisha: *See*—
Yamada, Hideaki; Otsuji, Shogo; Isobe, Kimiyasu; Matsunaga, Kuniyoshi; and Inukai, Tadahiko, 4,617,263, Cl. 435-25.000.
AMCO Manufacturing Corporation: *See*—
Heideman, Robert C., 4,616,771, Cl. 224-321.000.
Amende, Welf; Lausch, Wolfram; and Zechmeister, Hartwin, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Method of making wear-resistant cylinder, or cylinder liner surfaces. 4,617,070, Cl. 148-152.000.
American Brands, Inc.: *See*—
Chumney, Richard D., Jr., 4,616,664, Cl. 131-336.000.
American Can Company: *See*—
Krueger, Duane A.; and Odorzynski, Thomas W., 4,617,240, Cl. 428-476.100.
American Cyanamid Company: *See*—
Kerwar, Suresh S.; Sloboda, Adolph E.; and Ridge, Susan C., 4,617,319, Cl. 514-647.000.
Marei, Abdel H., 4,617,318, Cl. 514-520.000.
American Home Products Corporation: *See*—
Bagli, Jehan F.; and Peseckis, Steven M., 4,617,393, Cl. 544-319.000.
American Hospital Supply Corporation: *See*—
Alcala, Robert, 4,616,429, Cl. 36-7.200.
American Sterilizer Company: *See*—
Gehly, Joel C., 4,617,619, Cl. 362-804.000.
Mechlenburg, Douglas M., 4,616,501, Cl. 73-24.000.
Sundheimer, Craig S., 4,617,065, Cl. 134-25.400.
Amerock Corporation: *See*—
DeBruyn, William, 4,616,940, Cl. 384-248.000.
AMF Inc.: *See*—
Ostreicher, Eugene A., 4,617,128, Cl. 210-679.000.
Ammermann, Eberhard: *See*—
Eicken, Karl; Graf, Hermann; Gramlich, Walter; Sauter, Hubert; Rentzea, Costin; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, 4,617,303, Cl. 514-258.000.
Amoco Corporation: *See*—
Poppe, Wassily; Chen, Yu-Tsai; and Paschke, Edward E., 4,617,342, Cl. 524-606.000.
Amon, Leopold: *See*—
Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,617,672, Cl. 373-79.000.
AMP Incorporated: *See*—
Dola, Frank P., 4,616,897, Cl. 339-122.00R.
Feldman, Steven, 4,616,893, Cl. 339-14.00R.
Amra, Lutfi H.: *See*—
Chandler, Richard C.; and Amra, Lutfi H., 4,617,232, Cl. 428-328.000.
Amrhein, Reinhard, to Mannesmann Rexroth GmbH. Solenoid-actuated directional control valve. 4,616,675, Cl. 137-625.650.
Analysts, Inc.: *See*—
Plungis, Donald W.; Seymour, Charles S.; and Higgins, William, 4,616,503, Cl. 73-55.000.
Anchors, Inc.: *See*—
Adams, Truman W., 4,616,589, Cl. 114-210.000.
Anderson, Arndt S. Guitar composed of high strength-to-weight ratio material. 4,616,548, Cl. 84-1.160.
Anderson, Clyde G.; and Vara, Tomas E. Alcohol and distillers grain recovery process. 4,617,270, Cl. 435-161.000.
Anderson, George F., to Smith International, Inc. Welding fixture for rotary cone rock bits with belleville seals. 4,617,446, Cl. 219-121.0LC.
Anderson, Marie T.: *See*—
Maskalick, David G.; and Anderson, Marie T., 4,617,376, Cl. 530-308.000.
Anderson, Melvin J. Aerobic exercise machine. 4,616,825, Cl. 272-134.000.
Anderson, Russell W.; and Held, Michael J., to Manufacturers Tool Service, Inc. Indexable shell cutter. 4,616,965, Cl. 408-204.000.
Ando, Masao: *See*—
Senda, Kenichi; Ando, Masao; Nakamura, Kyoichi; and Nishida, Tatehiko, 4,617,322, Cl. 521-60.000.
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Melchior, Jean; Andre, Thierry; and Dourille, Alain, 4,616,481, Cl. 60-606.000.
Andrushkiw, Roman: *See*—
Andruszkiw, Walter; and Andrushkiw, Roman, 4,616,974, Cl. 415-4.000.
Andruszkiw, Walter; and Andrushkiw, Roman. Wind driven power generating apparatus. 4,616,974, Cl. 415-4.000.
Antlfinger, George J.: *See*—
Shah, Pravinchandra K.; and Antlfinger, George J., 4,617,230, Cl. 428-288.000.
Aoki, Iwao: *See*—
Araki, Tokio; and Aoki, Iwao, 4,616,443, Cl. 49-252.000.
Aonuma, Masashi; and Tamai, Yasuo, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,617,234, Cl. 428-328.000.
Aoyagi, Hirofumi: *See*—
Nagai, Kazutoshi; and Aoyagi, Hirofumi, 4,616,368, Cl. 4-420.200.
Aplix S.A.: *See*—
Billarant, Patrick J., 4,617,214, Cl. 428-40.000.
Aprica Kassai Kabushikikaisha: *See*—
Kassai, Kenzou, 4,616,371, Cl. 5-99.00A.
Kassai, Kenzou, 4,616,844, Cl. 280-650.000.
Arai, Shinichi: *See*—
Sakaue, Shiyuki; Sugimoto, Koichi; and Arai, Shinichi, 4,617,502, Cl. 318-568.000.
Arai, Shoji; Tamano, Yutaka; and Tsutsumi, Yukihiro, to Toyo Soda Manufacturing Co., Ltd. Catalyst for polyurethane having delay property. 4,617,286, Cl. 502-167.000.
Arai, Takao: *See*—
Noguchi, Takaharu; Kobayashi, Masaharu; Arai, Takao; and Shibuya, Toshifumi, 4,617,599, Cl. 360-32.000.
Arakawa, Satoshi, to Fuji Photo Optical Co., Ltd. Endoscope with an obtusely angled connecting section. 4,616,630, Cl. 128-4.000.
Arakawa, Shunsuke; and Suzuki, Hiroya, to Hitachi Metals, Ltd. Magnetic direction sensor. 4,616,424, Cl. 33-361.000.
Arakawa, Yoshichika: *See*—
Ogasawara, Tsunehiko; Arakawa, Yoshichika; Sumiya, Koji; and Sakaguchi, Yoshikazu, 4,616,531, Cl. 74-866.000.
Araki, Tokio; and Aoki, Iwao, to Sankyo Aluminium Industry Company Limited. Reversible window structure. 4,616,443, Cl. 49-252.000.
Araki, Toshiyuki: *See*—
Kyomasu, Mikio; Araki, Toshiyuki; Fukunaga, Shinobu; and Shindo, Masahiro, 4,617,649, Cl. 365-189.000.
Arao, Kozo; and Saitoh, Keishi, to Canon Kabushiki Kaisha. Photoconductive member of a Ge-Si layer and Si layer. 4,617,246, Cl. 430-65.000.
Arbed S.A.: *See*—
Schleich, Jean-Baptiste; Lahoda, Erwin; and Lickes, Jean-Paul, 4,616,464, Cl. 52-723.000.
Archimandritis, Spyridon C.: *See*—
Tsolis, Alexandros K.; and Archimandritis, Spyridon C., 4,617,184, Cl. 424-1.100.
Argant, Yves: *See*—
Lacroix, Roger; and Argant, Yves, 4,616,550, Cl. 84-173.000.
Arimoto, Shinobu: *See*—
Yoshida, Tadashi; Shimizu, Katsuichi; Arimoto, Shinobu; Maeshima, Katsuyoshi; Nagashima, Nao; and Watanabe, Asao, 4,617,596, Cl. 358-280.000.
Artiano, Adrian, to Beloit Corporation. Method of and apparatus for debarking wood chips. 4,616,785, Cl. 241-26.000.
Aryho, S.A.: *See*—
Agos, Angel, 4,616,688, Cl. 160-176.00R.
Asahi Glass Company Ltd.: *See*—
Manabe, Tsuneo; Kobayashi, Shigeyoshi; and Kijimuta, Hitoshi, 4,617,279, Cl. 501-10.000.
Sato, Kimihiko; Sajima, Yasuo; Nakao, Makoto; and Iwamoto, Junjiro, 4,617,101, Cl. 204-252.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Nagashima, Hironobu; and Koyama, Hiroshi, 4,616,636, Cl. 128-23.000.
Asahi Yukizai Kogyo Co., Ltd.: *See*—
Sano, Nichiro; and Ogawa, Hirotoshi, 4,616,804, Cl. 251-267.000.
Asai, Takashi: *See*—
Satoh, Toshio; Miyataka, Hideki; Masamoto, Yukimitsu; Asai, Takashi; Hasegawa, Kenji; and Kakegawa, Hisao, 4,617,292, Cl. 514-27.000.
Asaka, Masayuki: *See*—
Shinohe, Takashi; and Asaka, Masayuki, 4,617,583, Cl. 357-38.000.
Asano, Tetsuji; Kodama, Keiichi; and Shigeki, Terumitsu, to Toyoda Gosei Co., Ltd. Hydraulic brake hose. 4,617,213, Cl. 428-36.000.
Ashikaga, Tadashi; Kamanaka, Yoshihide; and Fushimi, Keiko, to Kabushiki Kaisha Meidensha. Digital PWMed pulse generator. 4,617,675, Cl. 375-22.000.
Ashjian, Henry: *See*—
Horodysky, Andrew G.; and Ashjian, Henry, 4,617,133, Cl. 252-32.500.
Ashland Oil, Inc.: *See*—
Goel, Anil, 4,617,391, Cl. 544-222.000.
Ashton, Wallace; Walton, Edward; and Tolman, Richard L., to Merck & Co., Inc. Purine derivatives. 4,617,304, Cl. 514-261.000.
Aslan, Ozay, to Cochrane-Dunlop Limited. Pegboard hangers. 4,616,753, Cl. 211-57.100.
Asrar, Jawed: *See*—
Blumstein, Alexandre; and Asrar, Jawed, 4,617,371, Cl. 528-194.000.
ASV Corporation: *See*—
Lemke, Gary, 4,616,724, Cl. 180-6.480.

AT&T Bell Laboratories: *See—*
Blonder, Greg E.; Lamola, Angelo A.; and Lieberman, Robert A., 4,617,608, Cl. 361-291.000.
Chin, Aland K.; Singh, Shobha; Uitert, LeGrand G. V.; and Zydzik, George J., 4,617,192, Cl. 427-42.000.
DePaolis, Michael V., Jr., 4,617,477, Cl. 307-443.000.
Jayant, Nuggehally S.; and Ramamoorthy, Venkatasubbarao, 4,617,676, Cl. 375-27.000.
MacChesney, John B.; Simpson, Jay R.; and Walker, Kenneth L., 4,616,901, Cl. 350-96.340.
Prezas, Dimitrios P.; and Zimmerman, Gustavus H., III, 4,616,659, Cl. 128-706.000.
AT&T Information Systems Inc.: *See—*
Lake, Carole J.; Shanley, James J.; and Silverstein, Steven M., 4,617,663, Cl. 371-25.000.
AT&T Technologies, Inc.: *See—*
Cushman, Robert H., 4,616,414, Cl. 29-835.000.
Atlantic Hydrodynamics, Inc.: *See—*
Hynes, Maurice A.; and Freeman, Roger L., 4,616,979, Cl. 417-231.000.
Atochem: *See—*
Augustin, Daniel; Leriche, Christian; and Poisson, Pierre, 4,617,354, Cl. 525-301.000.
Laine, Antoine; and Senez, Claude, 4,617,341, Cl. 524-591.000.
Au, Kenneth K., to Motorola, Inc. High speed data synchronizer which minimizes circuitry. 4,617,480, Cl. 307-480.000.
Aucouturier, Jeanne J.: *See—*
Leboutet, Hubert P.; and Aucouturier, Jeanne J., 4,617,494, Cl. 315-5.410.
Audureau, Joel: *See—*
Gloriod, Pierre; Audureau, Joel; and Pellegrini, Maurice, 4,617,366, Cl. 526-272.000.
Auer, John H., Jr.; Sibley, Henry C.; and Stewart, Leslie C., to General Signal Corporation. Vital message system with unique function identification. 4,617,662, Cl. 371-25.000.
Augat Inc.: *See—*
Stokoe, Philip T.; Cleaver, Glenn N.; and Boulais, Dennis R., 4,616,410, Cl. 29-743.000.
Augustin, Daniel; Leriche, Christian; and Poisson, Pierre, to Atochem. Adhesive compositions with thermoreversible crosslinking and uses therefor. 4,617,354, Cl. 525-301.000.
Aunstrup, Knud: *See—*
Olsen, Frank; and Aunstrup, Knud, 4,617,273, Cl. 435-232.000.
Aurki, S. Coop. Ltda.: *See—*
Rementeria, Manuel B., 4,616,507, Cl. 73-431.000.
Austin, Billy W.: *See—*
Owensby, Joseph E.; Dobbins, Frederick A.; and Austin, Billy W., 4,616,472, Cl. 53-459.000.
Auto/Con: *See—*
Matheson, Ronald R.; and Hucul, Daniel E., 4,616,978, Cl. 417-2.000.
Autoflug GmbH: *See—*
Sedlmayr, Gerhard, 4,616,850, Cl. 280-808.000.
AWB, Inc.: *See—*
Axford, Robert A.; Wood, Edgar C., Jr.; and Brandana, Herbert F., 4,616,537, Cl. 82-5.000.
Axford, Robert A.; Wood, Edgar C., Jr.; and Brandana, Herbert F., to AWB, Inc. Pipe connection. 4,616,537, Cl. 82-5.000.
B. F. Goodrich Company, The: *See—*
Myers, Ronald E., 4,617,353, Cl. 525-245.000.
Shah, Pravinchandra K.; and Antlfinger, George J., 4,617,230, Cl. 428-288.000.
Babcock-Hitachi Kabushiki Kaisha: *See—*
Kotaka, Ikuo, 4,616,697, Cl. 165-104.140.
Babcock & Wilcox Company, The: *See—*
Beauregard, Richard J.; and Boyd, John B., 4,616,393, Cl. 29-423.000.
Bohl, Thomas L., 4,617,277, Cl. 436-34.000.
Babisch, Guenter: *See—*
Strehler, Richard; and Babisch, Guenter, 4,616,730, Cl. 180-253.000.
Bacchelli, Luciano. Field producing instrument for the electrotherapeutic self-treatment of pain and insomnia. 4,616,654, Cl. 128-391.000.
Bach, Lars; and Stark, Eduard, to Her Majesty the Queen in right of the Province of Alberta as represented by the Minister of Energy and Natural Resources. Apparatus for the manufacture of a corrugated wafer board panel. 4,616,991, Cl. 425-396.000.
Baciu, Antoine; Jadamus, Hans; and Bittscheidt, Josef, to Cibie Projecteurs; and Chemische Werke Huls Aktiengesellschaft. Headlamp reflectors for automobile vehicles manufactured by injection molding according to the coinjection process using poly(alkylene terephthalate). 4,617,618, Cl. 362-341.000.
Back, Gerhard; Beffa, Fabio; and Buhler, Arthur, to Ciba-Geigy Corporation. 8-hydroxyquinoline sulfonic acid-azo chromium complexes. 4,617,382, Cl. 534-693.000.
Bagli, Jehan F.; and Peseckis, Steven M., to American Home Products Corporation. 5-substituted-6-aminopyrimidines, composition and uses as cardiotonic agents for increasing cardiac contractility. 4,617,393, Cl. 544-319.000.
Baker, David M.: *See—*
Drynan, David S.; and Baker, David M., 4,617,657, Cl. 370-60.000.
Baker, John C., to AEPLC. Structural bearings. 4,616,884, Cl. 384-7.000.
Baker Oil Tools, Inc.: *See—*
Stout, Gregg W.; and Myers, William D., Jr., 4,616,701, Cl. 166-55.100.
Baker, Robert G., to Nordson Corporation. Electrical connector for hot melt hose unit and gun. 4,616,894, Cl. 339-15.000.
Baldi, Alfonso L., to Alloy Surfaces Company, Inc. Diffusion coating mixtures. 4,617,202, Cl. 427-253.000.
Baldt Incorporated: *See—*
Albertini, Rocco D.; Clements, Ralph E.; and Grzeczkowski, Thomas V., 4,616,590, Cl. 114-230.000.
Balistee, Brian G.: *See—*
Tracy, David H.; and Balistee, Brian G., 4,617,079, Cl. 156-345.000.
Ball, Lewis C.; and Delia, Anthony F., to Total Air, Inc. Gaseous fluid distribution devices. 4,616,558, Cl. 98-40.110.
Ballachey, John M.; Jankowski, Leon V.; Johnson, C. W.; Ward, George S.; and Ward, John R., to Suncor Inc. Slant service rig. 4,616,454, Cl. 52-115.000.
Balthazor, Terry M.; and Pulwer, Mitchell J., to Monsanto Company. α-Substituted N-phosphonomethyliminodiacetic acid. 4,617,415, Cl. 558-169.000.
Bandurco, Victor T.; Bell, Stanley C.; Combs, Donald W.; and Falotico, Robert, to Ortho Pharmaceutical Corporation. 4-alkyl-5,6-methylenedioxy-2-1[H]-quinazolinones useful as cardiotonic agents. 4,617,392, Cl. 544-250.000.
Baptist Medical Center of Oklahoma, Inc.: *See—*
Richard, Gordon L., 4,617,536, Cl. 332-37.00D.
Bardoll, Meinrad, to Dr.Ing. h.c.F. Porsche Aktiengesellschaft. 4/3-directional control valve. 4,616,674, Cl. 137-596.180.
Bardos, Thomas J.; and Perlman, Michael E., to Research Foundation of State University of New York, The. Phosphoaziridine compounds useful for treatment of tumors. 4,617,398, Cl. 548-112.000.
Barfield, J. David. Key combination lock. 4,616,492, Cl. 70-284.000.
Barfurth, Dieter: *See—*
Nestler, Heinz; and Barfurth, Dieter, 4,617,408, Cl. 556-40.000.
Barker, Brian: *See—*
Brain, Michael; Wade, Richard D.; and Barker, Brian, 4,616,467, Cl. 53-134.000.
Barlow, Raymond S., to Pure Air Inc. Variable air diffuser. 4,616,559, Cl. 98-40.110.
Barnes, James M.: *See—*
Haas, Peter; Barnes, James M.; and Goyert, Wilhelm, 4,617,387, Cl. 544-74.000.
Barnie, James W.: *See—*
Rudko, Robert I.; and Barnie, James W., 4,617,668, Cl. 372-59.000.
Barrett, Sharon S.: *See—*
Whiteley, Gordon R.; Pritchard, Cynthia G.; and Barrett, Sharon S., 4,617,264, Cl. 435-34.000.
Barton, Donald L.: *See—*
Conley, Richard A.; and Barton, Donald L., 4,617,417, Cl. 560-29.000.
Barzuza, Ytzhak; and Lerner, Boaz, to Filtration Water Filters for Agriculture and Industry, Ltd. Filter element for filtering fluids. 4,617,120, Cl. 210-409.000.
BASF Aktiengesellschaft: *See—*
Dockner, Toni; Hagen, Helmut; and Krug, Herbert, 4,617,395, Cl. 546-178.000.
Eicken, Karl; Graf, Hermann; Gramlich, Walter; Sauter, Hubert; Rentzea, Costin; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, 4,617,303, Cl. 514-258.000.
Hoppe, Udo; Seib, Karl; Naegele, Paul; and Martin, Roland, 4,617,390, Cl. 544-197.000.
Horn, Peter; Baumann, Edwin; Marx, Matthias; and Gerarts, Peter, 4,617,225, Cl. 428-215.000.
Jahn, Dieter; Becker, Rainer; Keil, Michael; Himmele, Walter; and Wuerzer, Bruno, 4,617,050, Cl. 71-98.000.
Bassler, Jurgen: *See—*
Siekmann, Helmut E.; Bassler, Jurgen; and Liebig, Winfried, 4,617,130, Cl. 210-748.000.
Battiston, Joseph, to Tubular Fabricators, Industry, Inc. Invalid device having interlocking telescoping members. 4,616,668, Cl. 135-75.000.
Baumann, Edwin: *See—*
Horn, Peter; Baumann, Edwin; Marx, Matthias; and Gerarts, Peter, 4,617,225, Cl. 428-215.000.
Baumeler, Markus, to Sulzer Brothers Limited. Pneumatic servomotor. 4,616,477, Cl. 60-415.000.
Bausch & Lomb Incorporated: *See—*
Esmay, Edward N., 4,616,517, Cl. 74-10.450.
Baxter Travenol Laboratories, Inc.: *See—*
Kersten, Jean; and Mathias, Jean M., 4,616,760, Cl. 215-232.000.
Rollins, Richard A.; Sluga, Thomas J.; and Tobiasz, Henry, 4,617,161, Cl. 264-136.000.
Tseng, Charles C.; and Lynn, Kenneth, 4,616,802, Cl. 251-7.000.
Bayer Aktiengesellschaft: *See—*
Eichenauer, Herbert; and Ott, Karl-Heinz, 4,617,358, Cl. 526-81.000.
Freitag, Dieter; Bottenbruch, Ludwig; and Hucks, Uwe, 4,617,368, Cl. 528-126.000.
Haas, Peter; Barnes, James M.; and Goyert, Wilhelm, 4,617,387, Cl. 544-74.000.
Kohler, Peter; Ringe, Peter; and Heine, Heinrich, 4,617,061, Cl. 106-302.000.
Kossmehl, Gerhard; and Hocker, Jurgen, 4,617,143, Cl. 252-500.000.
Podszun, Wolfgang, 4,617,327, Cl. 523-116.000.
Ullrich, Martin; Hederich, Manfred; and Wingler, Frank, 4,617,089, Cl. 159-43.100.
Bayerische Motoren Werke AG: *See—*
Deicke, Axel; and Tigges, Michael, 4,617,510, Cl. 324-51.000.

Bazelaire, Bernard; and Clebant, Jean-Claude, to Commissariat a l'Energie Atomique. Automatic autonomous apparatus for the fast production of polyurethane foam. 4,617,174, Cl. 422-133.000.

Beacon, George: *See*—
Blumenthal, Scott; and Beacon, George, 4,616,776, Cl. 232-4.00R.

Beauregard, Richard J.; and Boyd, John B., to Babcock & Wilcox Company, The. Apparatus and method for rolling a metal matrix composite plate or sheet. 4,616,393, Cl. 29-423.000.

Beaussant, Raymond, to Intertechnique. Compensated valve for breathing system. 4,616,646, Cl. 128-205.240.

Bechtel International Corporation: *See*—
Wallace, Norman R.; and Jones, Edgerton G., 4,616,955, Cl. 405-158.000.

Beck, James P.: *See*—
Himmelstein, Sydney; Tveter, Richard S.; and Beck, James P., 4,616,512, Cl. 73-862.360.

Beckenbach, Walter; and Rinderle, Heinz, to Telefunken Electronic GmbH. Integrated amplifier circuit having RC network to suppress oscillation. 4,617,524, Cl. 330-307.000.

Becker, Larry W.; and Larson, Eric H., to Allied Corporation. Inverse emulsion polymers with improved incorporation of diallyldimethylammonium chloride. 4,617,362, Cl. 526-209.000.

Becker, Peter: *See*—
Kircher, Dieter; von Gruenberg, Hubertus; Blum, Klaus D.; and Becker, Peter, 4,616,727, Cl. 180-142.000.

Becker, Rainer: *See*—
Jahn, Dieter; Becker, Rainer; Keil, Michael; Himmele, Walter; and Wuerzer, Bruno, 4,617,050, Cl. 71-98.000.

Becton, Dickinson and Company: *See*—
Burns, James A., 4,616,649, Cl. 128-314.000.

Beffa, Fabio: *See*—
Back, Gerhard; Beffa, Fabio; and Buhler, Arthur, 4,617,382, Cl. 534-693.000.

Beghin-Say S.A.: *See*—
Pigneul, Raymond; Pannier, Dominique; and Tresca, Benoit, 4,617,022, Cl. 604-391.000.

Behm, Dean T.: *See*—
Lenz, Robert W.; and Behm, Dean T., 4,617,370, Cl. 528-191.000.

Behrens, Hugh C., to Dow Chemical Company, The. Process for making salt coated magnesium granules. 4,617,200, Cl. 427-216.000.

Belanger, Robert J.; and Bisignano, Alan G., to Irvine Sensors Corporation. Method for fabricating modules comprising uniformly stacked, aligned circuit-carrying layers. 4,617,160, Cl. 264-40.100.

Beler-Dowiday GmbH Werkzeug-Union: *See*—
Knebel, Fritz; and Dassel, Rudolf, 4,616,536, Cl. 81-128.000.

Bell Communications Research, Inc.: *See*—
Walters, Stephen M., 4,617,658, Cl. 370-84.000.

Bell, Stanley C.: *See*—
Bandurco, Victor T.; Bell, Stanley C.; Combs, Donald W.; and Falotico, Robert, 4,617,392, Cl. 544-250.000.

Bell, Weldon K.; Haag, Werner O.; Kirker, Garry W.; and Klocke, Donald J., to Mobil Oil Corporation. Low nitrogen iron-containing Fischer-Tropsch catalyst for conversion of synthesis gas and process for preparing the catalyst. 4,617,288, Cl. 502-331.000.

Bellafiore, Gaspare. Hearing aid. 4,617,429, Cl. 179-107.00E.

Beloit Corporation: *See*—
Artiano, Adrian, 4,616,785, Cl. 241-26.000.
Rodal, Jose J. A.; and Ewald, James L., 4,617,091, Cl. 162-343.000.

Belouet, Christian, to Compagnie Generale d'Electricite; and Societe Nationale Elf Aquitaine. Device for depositing a layer of silicon on a carbon tape. 4,616,595, Cl. 118-405.000.

Beltran, Delfin J. Excess tubing retainer for a fluid or gas delivery system. 4,616,790, Cl. 242-85.100.

Bender, Larry J. Nursing bottle holder. 4,616,795, Cl. 248-103.000.

Bennet, Justin D. Method of treating ulcerative colitis. 4,617,317, Cl. 514-458.000.

Bentley, James W.: *See*—
Schwab, Gerhart; Lee, Mei-Tsu; and Bentley, James W., 4,617,099, Cl. 204-133.000.

Benton, Jerry A. Pipe thread protector. 4,616,679, Cl. 138-96.00T.

Ber-Fong, Huang. Construction of a foaming machine. 4,616,936, Cl. 366-193.000.

Berfield, Robert C.; and Crevling, Robert, to Shop-Vac Corporation. Means for mounting floor pickup nozzle to dolly for vacuum cleaner. 4,616,378, Cl. 15-353.000.

Berg, Lars G.: *See*—
Ivarsson, Paul L.; Blom, Ingvar G. A.; and Berg, Lars G., 4,617,280, Cl. 501-84.000.

Berger, Jean-Luc, to Thomson-CSF. Process and apparatus for analyzing a photosensitive device having an interline-transfer structure. 4,617,595, Cl. 358-213.000.

Bergland, James H. Playing ball. 4,616,827, Cl. 273-58.00A.

Bernelin, Bernard; and de Salaberry, Bernard, to Ste. Francaise d'Equipements pour la Navigation Aerienne. Compact, integral, 6-mirror, triaxial, laser rate gyro. 4,616,929, Cl. 356-350.000.

Bert, Alain; and Mamodaly, Narguise, to Thomson CSF. Compact combiner for use with semiconductor devices in the microwave frequency range. 4,617,528, Cl. 331-56.000.

Berta, Dominic A., to Hercules Incorporated. Tire containing improved liner. 4,616,686, Cl. 152-510.000.

Berta, Dominic A., to Hercules Incorporated. Tire containing improved liner. 4,616,687, Cl. 152-510.000.

Berthiller, Franz. Biomass incinerator. 4,616,572, Cl. 110-254.000.

Bessin, Pierre; and Bonnet, Jacqueline, to Albert Rolland, S.A. Pharmaceutical compositions having immuno-suppressive properties. 4,617,315, Cl. 514-427.000.

Best Lock Corporation: *See*—
Best, Walter E.; and Foshee, William R., 4,616,394, Cl. 29-436.000.

Best, Walter E.; and Foshee, William R., to Best Lock Corporation. Method of lock capping. 4,616,394, Cl. 29-436.000.

Bethlehem Steel Corporation: *See*—
Krause, Richard H.; Pfeiffer, Thomas J.; and Horvath, Vincent V., 4,617,638, Cl. 364-557.000.

Bethmann, Karl W.: *See*—
Montier, Patrick; Sauvestre, Jean-Claude; Bethmann, Karl W.; Bisping, Bernhard; and Wallow, Peter, 4,616,569, Cl. 102-517.000.
Romer, Rudolf; Bethmann, Karl W.; Jaeneke, Christian; and Moll, Manfred, 4,616,567, Cl. 102-489.000.

Betz, John J. E., to Timron Instruments, Incorporated. Method and apparatus for surgical irrigation, aspiration and illumination. 4,617,013, Cl. 604-39.000.

Beutel, Achim, to Weissenfeld-Richters, H. Seal ring with tippably supported guide ring. 4,616,837, Cl. 277-153.000.

Bevilacqua, Bruce W.; Klug, Ralph W.; Carlsen, David C.; and Dinucci, Dennis J., to Westinghouse Electric Corp. Multi-spindle rotopeening apparatus. 4,616,498, Cl. 72-53.000.

BICC Public Limited Company: *See*—
Hagger, John M. R., 4,617,422, Cl. 174-23.00C.

Bicron Corporation: *See*—
Johnston, Joseph G., 4,617,680, Cl. 377-10.000.

Bidoia, Vincenzo, to Nordica S.p.A. Compact size actuating knob for adjusting and closure devices, particularly in ski boots. 4,616,524, Cl. 74-553.000.

Bienfait, Charles, to Solvay & Cie. Process for the polymerization of α-olefins. 4,617,360, Cl. 526-114.000.

Biermann, Udo K. P.: *See*—
Haisma, Jan; Heller, Petrus; Pasmans, Johannes M. M.; and Biermann, Udo K. P., 4,617,206, Cl. 427-374.100.

Bigg, Dennis; Morel, Claude; and Sevrin, Mireille, to Synthelabo. Alpha$_2$-antagonistic 2-(4,5-dihydro-1H-imidazol-2-yl)-pyrrolo[3,2,1-hi]indoles. 4,617,313, Cl. 514-402.000.

Billarant, Patrick J., to Aplix S.A. Strip or similar element for being attached to and covered by a molded article and method. 4,617,214, Cl. 428-40.000.

Billet, Rene , to Valeo. Clutch cover assembly. 4,616,741, Cl. 192-70.180.

Bingham, David, to Intersil, Inc. CMOS backup power switching circuit. 4,617,473, Cl. 307-66.000.

BioResearch Inc.: *See*—
Kurtz, Robert J., 4,617,020, Cl. 604-321.000.

Bisignano, Alan G.: *See*—
Belanger, Robert J.; and Bisignano, Alan G., 4,617,160, Cl. 264-40.100.

Bisping, Bernhard: *See*—
Montier, Patrick; Sauvestre, Jean-Claude; Bethmann, Karl W.; Bisping, Bernhard; and Wallow, Peter, 4,616,569, Cl. 102-517.000.

Bittscheidt, Josef: *See*—
Baciu, Antoine; Jadamus, Hans; and Bittscheidt, Josef, 4,617,618, Cl. 362-341.000.

Bjornberg, Sten G.; Hjerten, Wilhelm E. S.; and Wadstrom, Torkel M., to Landstingens Inkopscentral Lic Ekonomisk Forening. Bacteria adsorbing composition. 4,617,326, Cl. 523-111.000.

BKW Handels-und Vertriebsgesellschaft: *See*—
Kirsten, Walter, 4,616,787, Cl. 241-275.000.

Bleau, Charles D.; Gasper, Andrew, Jr.; Perlini, Julius J.; and Stricker, Alfred A. Side flap fold apparatus for a disk envelope. 4,617,081, Cl. 156-443.000.

Blesinger, James E.: *See*—
Slaats, Mathew A.; and Blesinger, James E., 4,616,877, Cl. 297-353.000.

Bliamptis, Tim E.: *See*—
Eisenhaure, David B.; Downer, James R.; Bliamptis, Tim E.; Oberbeck, George A.; and Hendrie, Susan D., 4,617,507, Cl. 322-4.000.

Blocher, Eberhard; Grob, Ferdinand; Schmidt, Peter-Jurgen; and Wahl, Josef, to Robert Bosch GmbH. Apparatus for metering an air-fuel mixture to an internal combustion engine. 4,616,618, Cl. 123-478.000.

Blom, Ingvar G. A.: *See*—
Ivarsson, Paul L.; Blom, Ingvar G. A.; and Berg, Lars G., 4,617,280, Cl. 501-84.000.

Blomberg, Anders. Injection device. 4,617,016, Cl. 604-155.000.

Blonder, Greg E.; Lamola, Angelo A.; and Lieberman, Robert A., to AT&T Bell Laboratories. Variable gap device and method of manufacture. 4,617,608, Cl. 361-291.000.

Bloomer, Milton D., to General Electric Company. Reverse phase-control apparatus for multiplexing interconnections between power switching and control circuit modules. 4,617,508, Cl. 323-237.000.

Bloomquist, Ted C.: *See*—
Cannon, Raymond E.; and Bloomquist, Ted C., 4,617,014, Cl. 604-67.000.

Bloxom, Ingrid B., Jr. Intestinal irrigation system with flow indicator. 4,617,011, Cl. 604-27.000.

Blum, Klaus D.: *See*—
Kircher, Dieter; von Gruenberg, Hubertus; Blum, Klaus D.; and Becker, Peter, 4,616,727, Cl. 180-142.000.

Blumbergs, Peter; and LaMontagne, Maurice P., to United States of America, Army. 4-methyl-5-(unsubstituted and substituted phenoxy)-2,6-dimethoxy-8-(aminoalkylamino) quinolines. 4,617,394, Cl. 546-157.000.

Blumenkranz, Robert M.: *See*—
Tarbutton, Victor F.; Mitchell, J. Edwin; and Blumenkranz, Robert M., 4,617,522, Cl. 330-149.000.

Blumenthal, Scott; and Beacon, George. Receptacle attached to a parking meter for collection of monies on a mass location basis as donations for charitable purposes. 4,616,776, Cl. 232-4.00R.

Blumstein, Alexandre; and Asrar, Jawed, to Blumstein, Alexandre. Novel polymeric liquid crystals and methods for their preparation. 4,617,371, Cl. 528-194.000.

Board of Regents, University of Texas System: *See*—
Peterson, Johnny W., 4,617,265, Cl. 435-38.000.

Board of Trustees, Leland Stanford, Jr. University: *See*—
Kuhn, Kelin J., 4,617,669, Cl. 372-70.000.

Bober, Helmut; Buthe, Theo; Coenen, Karl; Fartmann, Norbert; Herbertz, Klaus; Koch, Heinz; Kretschmer, Horst; Nienhaus, Clemens; Schardt, Peter; Schibrowski, Jurgen; and Schmandt, Willi, to Jean Walterscheid GmbH. Adjustable friction clutch assembly. 4,617,003, Cl. 464-48.000.

Boberski, William G.; Nugent, Richard M.; and Koren, Jeffrey G., to PPG Industries, Inc. Water-dispersible polymers containing metal chelating groups. 4,617,331, Cl. 523-420.000.

Bock, Lawrence A.: *See*—
Muenchow, John R.; Bock, Lawrence A.; and Lewis, Roger N., 4,617,324, Cl. 521-96.000.

Boden, Richard M.: *See*—
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,617,144, Cl. 252-522.00A.

Bodor, Nicholas S.; Estes, Kerry S.; and Simpkins, James W., to University of Florida. Method and compositions for weight control. 4,617,298, Cl. 514-176.000.

Boeing Company, The: *See*—
Chan, Yuen-Kwok, 4,617,567, Cl. 342-25.000.

Boes, Josef; and Saris, Leo, to Bulten-Kanthal GmbH. Process for manufacture of a vacuum-moulded electrical heating unit. 4,617,450, Cl. 219-345.000.

Boeve, Gerard J.; and De Cock, Etienne M., to Agfa-Gevaert N.V. Sheet imaging apparatus. 4,616,821, Cl. 271-213.000.

Bogie, Jon R.; and Quillen, Edward A., to Wiltronix Corporation. Battery charging apparatus and methods. 4,617,506, Cl. 320-2.000.

Bohl, Thomas L., to Babcock & Wilcox Company, The. Process and apparatus for monitoring ambient carbon monoxide. 4,617,277, Cl. 436-34.000.

Bohm, Jurgen: *See*—
Engelhard, Gerhard; Pellkofer, Dieter; Bohm, Jurgen; and Forner, Siegfried, 4,617,444, Cl. 219-75.000.

Bolz, Herbert: *See*—
Utner, Ferdinand; and Bolz, Herbert, 4,617,609, Cl. 361-310.000.

Bondar, Jerry. Replacement faucet handle kit. 4,616,673, Cl. 137-315.000.

Bone, Bertram T., Jr.: *See*—
Hinojos, Antonio R.; and Bone, Bertram T., Jr., 4,617,110, Cl. 208-211.000.

Bonnard, John A., to Leco Corporation. Apparatus for measuring thermal and other quantities of substances. 4,616,938, Cl. 374-38.000.

Bonnet, Jacqueline: *See*—
Bessin, Pierre; and Bonnet, Jacqueline, 4,617,315, Cl. 514-427.000.

Booher, Howard. Dump trailer with quiet cushions. 4,616,879, Cl. 298-10.000.

Bookvich, Steven. Nada drum and assembly. 4,616,551, Cl. 84-411.00A.

Borg-Warner Corporation: *See*—
Mott, Philip J., 4,617,004, Cl. 474-8.000.

Boris, Alfred; Partridge, John J.; and Uskokovic, Milan R., to Hoffmann-La Roche Inc. Method of treating disease states by the administration of 1α,25,26-trihydroxycholecalciferol. 4,617,297, Cl. 514-167.000.

Borror, Alan L.; Cincotta, Louis; and Lee, John W., Jr., to Polaroid Corporation. Novel xanthene compounds and their photographic use. 4,617,402, Cl. 548-455.000.

Bott, Arthur J.: *See*—
Lewis, James L., 4,616,970, Cl. 414-563.000.

Bottcher, Henning; Gottschlich, Rudolf; Hausberg, Hans-Heinrich; Seyfried, Christoph; and Minck, Klaus-Otto, to Merck Patent Gesellschaft mit beschrankter Haftung. Sulfur-containing indole derivatives. 4,617,309, Cl. 514-339.000.

Bottenbruch, Ludwig: *See*—
Freitag, Dieter; Bottenbruch, Ludwig; and Hucks, Uwe, 4,617,368, Cl. 528-126.000.

Boughton, Michael J., to Aluminum Company of America. Non-conductive plugger foot. 4,617,100, Cl. 204-245.000.

Boulais, Dennis R.: *See*—
Stokoe, Philip T.; Cleaver, Glenn N.; and Boulais, Dennis R., 4,616,410, Cl. 29-743.000.

Bouplon, Edward J., to Allied Steel & Tractor Products, Inc. Synchronous vibratory impact hammer. 4,616,716, Cl. 173-49.000.

Bowen, Richard M.: *See*—
Irwin, Christopher; and Bowen, Richard M., 4,617,166, Cl. 264-531.000.

Bowlds, Daniel P.; and Foster, Edward B., to General Electric Company. Directly modulated microwave oscillator having adjustable load coupling. 4,617,531, Cl. 331-96.000.

Boyd, Dana M.; and Bustin, Franz, to Mobil Oil Corporation. Method and apparatus for forming hems in superposed pliable panels. 4,617,008, Cl. 493-248.000.

Boyd, John B.: *See*—
Beauregard, Richard J.; and Boyd, John B., 4,616,393, Cl. 29-423.000.

Boyers, Charles L.; and Finlayson, John W., to Vetco Offshore Industries, Inc. Internal bore impression tool. 4,616,987, Cl. 425-89.000.

BP Chemicals Limited: *See*—
Green, Michael J., 4,617,154, Cl. 558-450.000.
Green, Michael J., 4,617,281, Cl. 502-62.000.
Green, Michael J.; and Kleiner, Gerhard A., 4,617,412, Cl. 556-446.000.

Braden, Rudolf: *See*—
Wolff, Erich; Langen, Hans; and Braden, Rudolf, 4,617,255, Cl. 430-553.000.

Brain, Michael; Wade, Richard D.; and Barker, Brian. Machine for inserting tabs in container packs. 4,616,467, Cl. 53-134.000.

Brandana, Herbert F.: *See*—
Axford, Robert A.; Wood, Edgar C., Jr.; and Brandana, Herbert F., 4,616,537, Cl. 82-5.000.

Brandt, Inc.: *See*—
Bryce, David R., 4,617,458, Cl. 235-449.000.

Braun, Camille; Danroc, Joel; Francois, Bernard; and Michel, Jean, to Commissariat a l'Energie Atomique. Process for treating a metal oxide powder. 4,617,158, Cl. 264-0.500.

Brauneck, Timothy W.: *See*—
Dilts, David A.; and Brauneck, Timothy W., 4,617,420, Cl. 136-244.000.

Bretzloff, Carl W., deceased (by Bretzloff, Lillian, executrix), to Campbell Soup Company. Mushroom supplement. 4,617,047, Cl. 71-5.000.

Bretzloff, Lillian, executrix: *See*—
Bretzloff, Carl W., deceased, 4,617,047, Cl. 71-5.000.

Breyer, Randall E.: *See*—
Hanaway, Roger D.; and Breyer, Randall E., 4,616,661, Cl. 130-27.0JT.

Bridgestone Corporation: *See*—
Hoshikawa, Kyofu; Ishiwatari, Seishiro; and Tanahashi, Mitsuru, 4,617,433, Cl. 200-86.00R.

Briggs, Cyril F. Golf club carrier and holder. 4,616,749, Cl. 206-315.200.

Brock, J. Donald. Drum mix asphalt plant with knock-out box and separate coater. 4,616,934, Cl. 366-4.000.

Brodzinski, Ronald L.; Perkins, Richard W.; Rieck, Henry G.; and Wogman, Ned A., to United States of America, Energy. Measurement of radionuclides in waste packages. 4,617,169, Cl. 376-257.000.

Broemer, Heinz; Deutscher, Klaus; Franek, Henning; and Reck, Ralf, to Ernst Leitz Wetzlar GmbH. Auditory ossicle prosthesis and process for its manufacture. 4,617,024, Cl. 623-10.000.

Bronkhorst High-Tech B.V.: *See*—
Jouwsma, Wijbren, 4,616,505, Cl. 73-204.000.

Bronshtein, Boris. Controlled process for making a chemically homogeneous melt for producing mineral wool insulation. 4,617,045, Cl. 65-134.000.

Brooks, Phillip L., to NEC Electronics U.S.A., Inc. Digital phase lock loop circuit. 4,617,679, Cl. 375-119.000.

Brothers, Glen E. Planting apparatus. 4,616,581, Cl. 111-85.000.

Brown, Candice H., to Advanced Micro Devices, Inc. Process of making a semiconductor device having parallel leads directly connected perpendicular to integrated circuit layers therein. 4,616,406, Cl. 29-588.000.

Brown, Geoffrey D.: *See*—
Keogh, Michael J.; Wallace, Scott L.; and Brown, Geoffrey D., 4,617,338, Cl. 524-437.000.

Brown, Kenneth A., to Second Chance Systems, Inc. Emergency light and smoke alarm system. 4,617,561, Cl. 340-628.000.

Brown, William R.; Cassano, Anthony A.; Dunbobbin, Brian R.; Rao, Pradip; and Erickson, Donald C., to Air Products and Chemicals, Inc. Cascade heat recovery with coproduct gas production. 4,617,182, Cl. 423-579.000.

Browne, Leslie J., to Ciba-Geigy Corporation. Substituted imidazo[1,5-A]pyridine derivatives as aromatase inhibitors. 4,617,307, Cl. 514-300.000.

Brundage, Richard B.: *See*—
Eccardt, Curtis J.; and Brundage, Richard B., 4,616,541, Cl. 83-98.000.

Brundrett, Ewart; and Brundrett, Laurence, to Canadian Patents and Development Limited. Exhaust air heat exchanger. 4,616,696, Cl. 165-54.000.

Brundrett, Laurence: *See*—
Brundrett, Ewart; and Brundrett, Laurence, 4,616,696, Cl. 165-54.000.

Brunet, Patrice, to Poutrait-Morin. Quick-coupling connector. 4,616,859, Cl. 285-317.000.

Brunette Machine Works, Ltd.: *See*—
Hards, John E., 4,616,542, Cl. 83-155.000.

Brunson, Welton K.: *See*—
Hubbard, Vance M.; and Brunson, Welton K., 4,617,017, Cl. 604-179.000.

Bryant, David V., to General Electric Company. Swivel mount. 4,617,430, Cl. 179-146.00R.

Bryant, Edgar E., to Ultimate Security Products Corp. Lock for releasably holding a hinged guard element on a window. 4,616,863, Cl. 292-302.000.

Bryce, David R., to Brandt, Inc. Counterfeit detection circuit. 4,617,458, Cl. 235-449.000.

BSO Steuerungstechnik GmbH: *See*—
Ruppert, Martin, 4,617,498, Cl. 318-85.000.

Buchwald, Paul K., Jr., to Burroughs Corporation. Current sensing resistance apparatus. 4,617,548, Cl. 338-325.000.

Buck, Loren L., to Pro-Quip Corporation. Separating hydrocarbon gases. 4,617,039, Cl. 62-26.000.

Buderus Aktiengesellschaft: *See—*
Heinzl, Burno; Frowein, Herbert; Stiegler, Hartmut; Wurz, Joachim; Schmidt, Horst; Huttel, Willi; and Schmitz, Karl-Heinz, 4,616,754, Cl. 211-71.000.

Buelens, Edward; and Goossens, Carolus C., to AGFA-Gevaert N.V. Light-tight cassette. 4,616,914, Cl. 354-277.000.

Bueno, Alfredo, to Dynapac AB. Brake arrangement for hydraulically powered vehicles. 4,616,882, Cl. 303-68.000.

Buhler, Arthur: *See—*
Back, Gerhard; Beffa, Fabio; and Buhler, Arthur, 4,617,382, Cl. 534-693.000.

Buhlmann, Hans: *See—*
Welzel, Dieter; and Buhlmann, Hans, 4,617,306, Cl. 514-288.000.

Buijsen, Johannes C. M., to U.S. Philips Corporation. Electric motor with a torsionally flexible rotor mount. 4,617,484, Cl. 310-51.000.

Bullock, Donald F.; Wilson, Austin F.; Lemay, Marshall A.; and Miles, David B., to General Electric Company. Disk and gear mounting in electric watthour meter. 4,617,514, Cl. 324-137.000.

Bulten-Kanthal GmbH: *See—*
Boes, Josef; and Saris, Leo, 4,617,450, Cl. 219-345.000.

Buma, Shuuichi, to Toyota Jidosha Kabushiki Kaisha. Air suspension. 4,616,811, Cl. 267-35.000.

Bunch, Richard P.; and Smith, Lloyd S., to Converse Inc. Shoe upper with lateral fastening arrangement. 4,616,432, Cl. 36-50.000.

Burlington Industries, Inc.: *See—*
Zybko, Walter C., 4,617,210, Cl. 428-35.000.

Burniski, Edward W.; and Jannuzzi, Michael A. Easy clean pet litter box. 4,616,598, Cl. 119-1.000.

Burns, James A., to Becton, Dickinson and Company. Lancet. 4,616,649, Cl. 128-314.000.

Burns, Stanley G., to Iowa State University Research Foundation. Moisture measurement apparatus and method. 4,616,425, Cl. 34-13.800.

Burrough, Donald E.; and Viesselmann, Kim P., to Gehl Company. Forage blower having a removable outlet transition member. 4,616,961, Cl. 406-99.000.

Burroughs Corporation: *See—*
Buchwald, Paul K., Jr., 4,617,548, Cl. 338-325.000.
Subbarao, Wunnava V.; and Ely, Richard I., 4,617,461, Cl. 250-229.000.

Burrows, Larry N.; and Gregory, Truman L. Pipeline padding machine. 4,616,957, Cl. 405-179.000.

Busetto, Carlo: *See—*
Costanzi, Silvestro; Traverso, Enrico; Podesta , Roberto; Gussoni, Damiano; and Busetto, Carlo, 4,617,333, Cl. 524-96.000.

Bush, Bruce A.: *See—*
Washer, Stone P.; and Bush, Bruce A., 4,616,669, Cl. 137-1.000.

Bustin, Franz: *See—*
Boyd, Dana M.; and Bustin, Franz, 4,617,008, Cl. 493-248.000.

Buthe, Theo: *See—*
Bober, Helmut; Buthe, Theo; Coenen, Karl; Fartmann, Norbert; Herbertz, Klaus; Koch, Heinz; Kretschmer, Horst; Nienhaus, Clemens; Schardt, Peter; Schibrowski, Jurgen; and Schmandt, Willi, 4,617,003, Cl. 464-48.000.

Butler, Donald E., to Warner-Lambert Company. 5-oxo-2-pyrrolidinepropanoic acid derivatives and use as cognition activators. 4,617,310, Cl. 514-343.000.

Byer, Norman E.: *See—*
Chen, Wenpeng; and Byer, Norman E., 4,617,532, Cl. 331-107.00R.

Byers, Stuart D.; and Clark, John F., to Crophandling Systems Limited. Storage vessel and method of assembly. 4,616,465, Cl. 52-748.000.

C. A. Weidmuller GmbH & Co.: *See—*
Wiener, Hans; and Undin, Hans, 4,616,533, Cl. 81-9.410.

Cabaud, Aime . Method of applying contacts to circuit support. 4,616,416, Cl. 29-884.000.

Caddick, Mary J. Water craft and method for removing weeds and pollutants from navigable waters. 4,616,588, Cl. 114-162.000.

Cadenhead, Roy A., Sr., to Modern Fibers, Inc. Non-directional, synthetic, outdoor carpet. 4,617,208, Cl. 428-17.000.

Cadenhead, Roy A., Sr., to Modern Fibers, Inc. Tightly curled, cut pile, tufted carpet. 4,617,218, Cl. 428-92.000.

Cairns, James L., to Lockheed Corporation. Coaxial underwater electro-optical connector. 4,616,900, Cl. 350-96.200.

Calamai, Edward. *See—*
Lowell, Ross; Seligman, Marvin; and Calamai, Edward, 4,616,384, Cl. 24-335.000.

Cama, Lovji D.: *See—*
Christensen, Burton G.; Cama, Lovji D.; and Schmitt, Susan M., 4,617,152, Cl. 540-200.000.

Camco, Incorporated: *See—*
Johnston, Russell A., 4,616,704, Cl. 166-242.000.

Campbell, Bonnie J.: *See—*
Cunningham, James L.; and Campbell, Bonnie J., 4,616,391, Cl. 29-157.3AH.

Campbell Soup Company: *See—*
Bretzloff, Carl W., deceased, 4,617,047, Cl. 71-5.000.

Campolmi, Stefano: *See—*
Ugo, Renato; Campolmi, Stefano; and Carletti, Vittorio, 4,617,416, Cl. 558-242.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines & Resources: *See—*
Poirier, Marc-Andre, 4,617,062, Cl. 106-273.00R.

Canadian Patents and Development Limited: *See—*
Brundrett, Ewart; and Brundrett, Laurence, 4,616,696, Cl. 165-54.000.

Cannon, Raymond E.; and Bloomquist, Ted C., to Warner-Lambert Company. Dual mode I. V. infusion device. 4,617,014, Cl. 604-67.000.

Canon Kabushiki Kaisha: *See—*
Akashi, Akira; and Yamada, Masanori, 4,617,459, Cl. 250-201.000.
Arao, Kozo; and Saitoh, Keishi, 4,617,246, Cl. 430-65.000.
Miyakawa, Akira, 4,617,580, Cl. 346-136.000.
Sakurai, Masaaki, 4,616,917, Cl. 355-3.0FU.
Someya, Hiromi; Aihara, Yoshihiko; Suzuki, Nobuyuki; and Mizogui, Toyokazu, 4,616,916, Cl. 354-442.000.
Suzuki, Masayuki; Fukahori, Hidehiko; Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; and Ohara, Tsunemasa, 4,616,913, Cl. 354-173.100.
Takahashi, Kazuo; Sato, Hiroshi; and Kosugi, Masao, 4,617,469, Cl. 250-548.000.
Tanaka, Shigemori; Sumino, Fumio; Kubo, Keiji; Hisamura, Masafumi; Toma, Hitoshi; and Fujimura, Naoto, 4,617,245, Cl. 430-58.000.
Yoshida, Tadashi; Shimizu, Katsuichi; Arimoto, Shinobu; Maeshima, Katsuyoshi; Nagashima, Nao; and Watanabe, Asao, 4,617,596, Cl. 358-280.000.

Carboni, Luigi, to S.I.V. S.p.A., a part interest. Silencing system for exhaust gases from internal combustion engines. 4,616,732, Cl. 181-232.000.

Cari-All Inc.: *See—*
Trubiano, Antoine, 4,616,839, Cl. 280-33.99R.

Carl Hurth Maschinen und Zahnradfabrik GmbH & Co.: *See—*
Strehler, Richard; and Babisch, Guenter, 4,616,730, Cl. 180-253.000.

Carletti, Vittorio: *See—*
Ugo, Renato; Campolmi, Stefano; and Carletti, Vittorio, 4,617,416, Cl. 558-242.000.

Carlin, Richard T.: *See—*
Pez, Guido P.; and Carlin, Richard T., 4,617,029, Cl. 55-16.000.

Carlsen, David C.: *See—*
Bevilacqua, Bruce W.; Klug, Ralph W.; Carlsen, David C.; and Dinucci, Dennis J., 4,616,498, Cl. 72-53.000.

Carpenter, Richard G., to Crane Co. Canned motor pumps pressurized recirculation system. 4,616,980, Cl. 417-357.000.

Carrier Corporation: *See—*
Leonard, Gary S., 4,616,483, Cl. 62-115.000.

Carter, Deborah H.: *See—*
Hiscock, Donald F.; Jacomet, Joe A.; and Carter, Deborah H., 4,617,223, Cl. 428-211.000.

Cash, David J., to Talman Home Federal Savings and Loan Association of Illinois, The. Money debit card application form and method of processing same. 4,616,852, Cl. 282-27.00R.

Caspar, Peter: *See—*
Ehrlinger, Friedrich; Katzorek, Karl-Hermann; Dziuba, Peter; Veser, Karl; and Caspar, Peter, 4,616,520, Cl. 74-325.000.

Caspar, Wolfhard; Lutze, Theodor; and Schwarz, Theodor, to Aesculap-Werke Aktiengesellschaft. Surgical instrument for the splaying of wound edges. 4,616,635, Cl. 128-20.000.

Caspari, Richard B.; Whipple, Terry L.; and Thimsen, James A., to Precision Surgical Instruments, Inc. Shoulder traction apparatus. 4,616,637, Cl. 128-84.00R.

Cassano, Anthony A.: *See—*
Brown, William R.; Cassano, Anthony A.; Dunbobbin, Brian R.; Rao, Pradip; and Erickson, Donald C., 4,617,182, Cl. 423-579.000.

Caterpillar Inc.: *See—*
Knell, Harvey A.; and Rumble, Lloyd B., 4,616,433, Cl. 37-141.00T.
O'Donohue, William T., 4,617,447, Cl. 219-124.310.
Staniak, Waldema A.; Samuelson, Robert E.; and Moncelle, Michael E., 4,616,616, Cl. 123-357.000.

Caterpillar Industrial Inc.: *See—*
Paine, John C., 4,617,639, Cl. 364-569.000.

Cayton, Steven D.: *See—*
Steinkuhl, Allan R.; and Cayton, Steven D., 4,616,671, Cl. 137-101.000.

Cebulla, Norbert: *See—*
Riba, Gunther; and Cebulla, Norbert, 4,616,434, Cl. 38-140.000.

Cederroths AB: *See—*
Adolfsson, Roger, 4,616,755, Cl. 211-89.000.

Celanese Corporation: *See—*
Hagedorn, Scott, 4,617,156, Cl. 260-513.00R.
Rasoul, Husam A. A., 4,617,399, Cl. 548-152.000.
Scott, Bruce D.; and Watkins, James W., 4,617,194, Cl. 427-54.100.

Central Glass Company, Limited: *See—*
Maeda, Kazuhiko; and Kawada, Akira, 4,617,350, Cl. 525-153.000.

Centre National de la Recherche Scientifique: *See—*
Corriu, Robert J.; Cerveau, Genevieve E.; Chuit, Claude G.; and Reye, Catherine, 4,617,413, Cl. 556-464.000.
Elissando, Bernard; Pereyre, Michel; and Quintard, Jean-Paul, 4,617,409, Cl. 556-87.000.

Cerveau, Genevieve E.: *See—*
Corriu, Robert J.; Cerveau, Genevieve E.; Chuit, Claude G.; and Reye, Catherine, 4,617,413, Cl. 556-464.000.

Cetus Corporation: *See—*
Sheldon, Edward L., III; Levenson, Corey H.; Mullis, Kary B.; Rapoport, Henry; and Watson, Robert M., 4,617,261, Cl. 435-6.000.

Cewers, Goeran; Johansson, Jan; and Olsson, Sven-Gunnar, to Siemens Elema AB; and Siemens Aktiengesellschaft. Apparatus to regulate the flow of liquids. 4,616,801, Cl. 251-6.000.

CGR-MEV: *See—*
Leboutet, Hubert P.; and Aucouturier, Jeanne J., 4,617,494, Cl. 315-5.410.

Chan, Yiu-Fai: *See—*
Hartmann, Robert F.; Wong, Sau-Ching; Chan, Yiu-Fai; and Ou, Jung-Hsing, 4,617,479, Cl. 307-465.000.

Chan, Yuen-Kwok, to Boeing Company, The. Automatic motion compensation for residual motion in a synthetic aperture radar system. 4,617,567, Cl. 342-25.000.

Chandler, Richard C.; and Amra, Lutfi H., to Kennecott Corporation. Corrosion and wear resistant graphite material. 4,617,232, Cl. 428-328.000.

Chang, Gordon Kuo-Chon: *See—*
Chuang, Chiu-Hsiung, 4,617,541, Cl. 335-133.000.

Chang, Phillip: *See—*
Adley, James M.; and Chang, Phillip, 4,616,919, Cl. 355-3.0DD.

Chang, Y. Alice: *See—*
Funk, Edward W.; Kulkarni, Sudhir S.; and Chang, Y. Alice, 4,617,126, Cl. 210-651.000.

Charbonnages de France: *See—*
Large, Jean F., 4,616,426, Cl. 34-57.00A.

Charles Stark Draper Laboratory, Inc., The: *See—*
Eisenhaure, David B.; Downer, James R.; Bliamptis, Tim E.; Oberbeck, George A.; and Hendrie, Susan D., 4,617,507, Cl. 322-4.000.

Charmilles Technologies, S.A.: *See—*
Martin, Roland, 4,617,443, Cl. 219-69.00C.

Cheetham, Peter S. J.: *See—*
Rathbone, Elner B.; Hacking, Andrew J.; and Cheetham, Peter S. J., 4,617,269, Cl. 435-97.000.

Chemische Werke Huls Aktiengesellschaft: *See—*
Baciu, Antoine; Jadamus, Hans; and Bittscheidt, Josef, 4,617,618, Cl. 362-341.000.

Chen, Hung-Chih: *See—*
Park, Kyong; and Chen, Hung-Chih, 4,617,607, Cl. 361-283.000.

Chen, Wenpeng; and Byer, Norman E., to Martin Marietta Corporation. Optically stabilized semiconductor microwave diodes. 4,617,532, Cl. 331-107.00R.

Chen, Yu-Tsai: *See—*
Poppe, Wassily; Chen, Yu-Tsai; and Paschke, Edward E., 4,617,342, Cl. 524-606.000.

Cheng, Tsung-Hua. Molding jack base. 4,616,807, Cl. 254-93.00H.

Chevron Research Company: *See—*
Plavac, Frank, 4,617,137, Cl. 252-49.600.
Suh, Sung L.; Reeds, Carter B.; Van Scherpe, Peter; and Silcox, William H., 4,617,031, Cl. 55-52.000.
Wollenberg, Robert H., 4,617,138, Cl. 252-51.50A.

Chiavon, Ezio R. Tamper-proof threaded fastenings. 4,616,535, Cl. 81-121.100.

Chiba, Toshihiko, to Pioneer Electronic Corporation. Data signal reading device. 4,617,677, Cl. 375-94.000.

Chicago Rawhide Mfg. Co.: *See—*
Drygalski, Gordon T.; Otto, Dennis L.; and Ross, Donald K., 4,616,836, Cl. 277-152.000.

Chin, Aland K.; Singh, Shobha; Uitert, LeGrand G. V.; and Zydzik, George J., to AT&T Bell Laboratories. Process for making optical INP devices. 4,617,192, Cl. 427-42.000.

Chirom-Werke GmbH: *See—*
Rutschle, Eugen; Haninger, Rudolf; and Winkler, Hans-Henning, 4,616,398, Cl. 29-568.000.

Chisso Corporation: *See—*
Inoue, Hiromichi; Inukai, Takashi; Goto, Yasuyuki; Sato, Hideo; and Fukui, Masahiro, 4,617,141, Cl. 252-299.630.
Kinoshita, Akihiro; Namariyama, Yohichi; and Higashi, Hiromi, 4,617,254, Cl. 430-326.000.
Sugimori, Shigeru, 4,617,142, Cl. 252-299.630.

Cho, Saeng K. Lighting device for cigarettes. 4,616,665, Cl. 131-351.000.

Chodak, Jan B.: *See—*
Klock, Anita H.; and Chodak, Jan B., 4,617,643, Cl. 364-900.000.

Chopping, Geoffrey; Lawrie, Ian J.; and Maric, Milan Z., to Plessey Company plc, The. Frame aligner for use in telecommunications systems. 4,617,659, Cl. 370-100.000.

Choquer, Jean; and Gartner, Thierry, to Societe Technique d'Applicatioon et de Recherche Electronique. Tuned band-switching loop antenna. 4,617,571, Cl. 343-744.000.

Christ, Charles. Processes and installations for treating waste waters issuing from the manufacture of sauerkraut. 4,617,123, Cl. 210-611.000.

Christensen, Burton G.; Cama, Lovji D.; and Schmitt, Susan M., to Merck & Co., Inc. β-lactams containing an α-exocyclic double bond. 4,617,152, Cl. 540-200.000.

Christoff, Paul B., to Minigrip, Inc. Reclosable bag, material, and method of and means for making same. 4,617,683, Cl. 383-63.000.

Christophersen, John A.; Marquardt, Fred J.; and Zipperian, Donald E., to Deister Concentrator Company, Inc. Flotation separating system. 4,617,113, Cl. 209-170.000.

Chrysler Corporation: *See—*
White, George E.; and Heckel, Dennis C., 4,616,522, Cl. 74-492.000.

Chu, Raymond D.; Rubner, Anthony C.; and Fellinger, Michael W., to Lifecare Services, Inc. Servo control system for a reciprocating piston respirator. 4,617,637, Cl. 364-505.000.

Chuang, Chiu-Hsiung, to Huang, Pen-Ho; and Chang, Gordon Kuo-Chon, a part interest to each. Electromagnetic starter for reversible motor. 4,617,541, Cl. 335-133.000.

Chuang, Tung J.; Houle, Frances A.; and Petersen, Kurt E., to International Business Machines Corporation. Rapid etching method for silicon by SF_6 gas. 4,617,086, Cl. 156-643.000.

Chuit, Claude G.: *See—*
Corriu, Robert J.; Cerveau, Genevieve E.; Chuit, Claude G.; and Reye, Catherine, 4,617,413, Cl. 556-464.000.

Chum, Helena L.; Ratcliff, Matthew A.; and Palasz, Peter D., to United States of America, Energy. Process for producing peracids from aliphatic hydroxy carboxylic acids. 4,617,090, Cl. 162-16.000.

Chumney, Richard D., Jr., to American Brands, Inc. Tobacco product. 4,615,664, Cl. 131-336.000.

Ciba-Geigy: *See—*
Lees, Michael J., 4,617,129, Cl. 210-700.000.

Ciba-Geigy Corporation: *See—*
Albert, Alban; Courbat, Pierre; and Weith, Andre , 4,617,296, Cl. 514-100.000.
Back, Gerhard; Beffa, Fabio; and Buhler, Arthur, 4,617,382, Cl. 534-693.000.
Browne, Leslie J., 4,617,307, Cl. 514-300.000.
Hinson, James W.; and Cleverdon, Jo A., 4,617,380, Cl. 534-576.000.
Hinson, James W.; and Cleverdon, Jo A., 4,617,381, Cl. 534-576.000.
Mayer, Carl W.; Kvita, Vratislav; and Pfeifer, Josef, 4,617,151, Cl. 540-1.000.
Pallie, Kemal D.; and Dessauges, Gerald, 4,617,357, Cl. 525-506.000.
Pastor, Stephen D.; and Odorisio, Paul, 4,617,336, Cl. 524-291.000.
Pfeifer, Josef, 4,617,375, Cl. 528-344.000.
Steinberg, David H.; and Cortolano, Frank, 4,617,404, Cl. 549-90.000.

Cibie Projecteurs: *See—*
Baciu, Antoine; Jadamus, Hans; and Bittscheidt, Josef, 4,617,618, Cl. 362-341.000.

Cincotta, Louis: *See—*
Borror, Alan L.; Cincotta, Louis; and Lee, John W., Jr., 4,617,402, Cl. 548-455.000.

Clark, Jeffrey S., to Data General Corporation. Select switch responsive to a break code. 4,617,642, Cl. 364-900.000.

Clark, John F.: *See—*
Byers, Stuart D.; and Clark, John F., 4,616,465, Cl. 52-748.000.

Cleaver, Glenn N.: *See—*
Stokoe, Philip T.; Cleaver, Glenn N.; and Boulais, Dennis R., 4,616,410, Cl. 29-743.000.

Clebant, Jean-Claude: *See—*
Bazelaire, Bernard; and Clebant, Jean-Claude, 4,617,174, Cl. 422-133.000.

Clegg, John E. Ultraviolet beam concentrator. 4,616,904, Cl. 350-432.000.

Clegg, John E. Louvered convergent conical lens. 4,616,905, Cl. 350-432.000.

Clements, Ralph E.: *See—*
Albertini, Rocco D.; Clements, Ralph E.; and Grzeczkowski, Thomas V., 4,616,590, Cl. 114-230.000.

Cleverdon, Jo A.: *See—*
Hinson, James W.; and Cleverdon, Jo A., 4,617,380, Cl. 534-576.000.
Hinson, James W.; and Cleverdon, Jo A., 4,617,381, Cl. 534-576.000.

Coal Industry (Patents) Limited: *See—*
Gibson, Harold; Lynch, Gordon; Mark, David; and Vincent, James H., 4,616,513, Cl. 73-863.230.

Cochrane-Dunlop Limited: *See—*
Aslan, Ozay, 4,616,753, Cl. 211-57.100.

Coenen, Karl: *See—*
Bober, Helmut; Buthe, Theo; Coenen, Karl; Fartmann, Norbert; Herbertz, Klaus; Koch, Heinz; Kretschmer, Horst; Nienhaus, Clemens; Schardt, Peter; Schibrowski, Jurgen; and Schmandt, Willi, 4,617,003, Cl. 464-48.000.

Cohen, Mitchell S.: *See—*
Sachdev, Krishna G.; Afzali-Ardakani, Ali; Pennington, Keith S.; and Cohen, Mitchell S., 4,617,579, Cl. 346-135.100.

Cole, Herbert S., Jr.; Liu, Yung S.; and Philipp, Herbert R., to General Electric Company. Process for removing organic material in a patterned manner from an organic film. 4,617,085, Cl. 156-643.000.

Coleman Company, Inc., The: *See—*
Milliman, Keith, 4,616,622, Cl. 124-73.000.

Collins, Paul W.; and Weier, Richard M., to G. D. Searle & Co. 3-oxaprostaglandins. 4,617,411, Cl. 556-443.000.

Collonia, Harald, to VDO Adolf Schindling AG. Device for electric regulation of idle of internal combustion engines. 4,616,613, Cl. 123-339.000.

Combs, Donald W.: *See—*
Bandurco, Victor T.; Bell, Stanley C.; Combs, Donald W.; and Falotico, Robert, 4,617,392, Cl. 544-250.000.

Comdisco Resources, Inc.: *See—*
Hanson, Merle E.; Titchener, Paul F.; and Hamberlin, Clifford W., 4,616,702, Cl. 166-65.100.

Commissariat a l'Energie Atomique: *See—*
Bazelaire, Bernard; and Clebant, Jean-Claude, 4,617,174, Cl. 422-133.000.
Braun, Camille; Danroc, Joel; Francois, Bernard; and Michel, Jean, 4,617,158, Cl. 264-0.500.
Detriche, Jean-Marie, 4,617,504, Cl. 318-576.000.
Feutrel, Claude, 4,617,171, Cl. 376-446.000.
Potard, Claude, 4,617,084, Cl. 156-607.000.

Commonwealth of Puerto Rico: *See—*
Vargas Garcia, Arturo, 4,616,633, Cl. 128-20.000.
Vargas Garcia, Arturo, 4,616,634, Cl. 128-20.000.

Comonwealth Scientific and Industrial Research Organization and CSR Limited: *See—*
Mandelson, John; McCarthy, David J.; Sitnai, Oto; and Whitehead, Alan B., 4,617,107, Cl. 208-427.000.

Compagnie Generale d'Electricite: *See—*
Belouet, Christian, 4,616,595, Cl. 118-405.000.

Conley, Richard A.; and Barton, Donald L., to Ortho Pharmaceutical Corporation. Alkyl 2-carboalkoxy-3,4-dialkoxybenzenecarbamates and process for their preparation. 4,617,417, Cl. 560-29.000.

Control Devices, Incorporated: *See—*
Krechel, Joseph L.; and Purvis, Michael J., 4,616,677, Cl. 137-881.000.

Controls Company of America: *See—*
Hanssen, Tore B.; and Kahale, Abed G., 4,617,432, Cl. 200-81.00R.

Converse Inc.: *See—*
Bunch, Richard P.; and Smith, Lloyd S., 4,616,432, Cl. 36-50.000.

Cooper Tire & Rubber Company: *See—*
Adams, Norman R.; and Gifford, Charles A., 4,616,676, Cl. 137-636.400.

CooperBiomedical, Inc.: *See—*
Maxim, Peter E.; and Veltri, Robert W., 4,617,262, Cl. 435-7.000.

Corbet, Jean-Pierre; Cotrel, Claude; Farge, Daniel; and Paris, Jean-Marc, to Rhone-Poulenc Sante. Synergistine derivatives, their preparation and pharmaceutical compositions containing them. 4,617,290, Cl. 514-11.000.

Corbet, Jean-Pierre; Cotrel, Claude; Farge, Daniel; and Paris, Jean-Marc, to Rhone-Poulenc Sante. Synergistine derivatives and their preparation. 4,617,377, Cl. 530-317.000.

Cordes, William F., III; and Jeffries, Alfred T., III, to Philip A. Hunt Chemical Corporation. Antireflective coatings for use in the manufacture of semi-conductor devices, methods and solutions for making such coatings, and the method for using such coatings to absorb light in ultraviolet photolithography processes. 4,617,252, Cl. 430-272.000.

Cordis Corporation: *See—*
Weinberg, Alvin H.; and Jones, W. Kinzy, 4,616,655, Cl. 128-419.00P.

Cornell Research Foundation, Inc.: *See—*
Narang, Saran A.; and Wu, Ray J., 4,617,384, Cl. 536-27.000.

Cornsweet, Milton D.: *See—*
Pilant, Frank J.; and Cornsweet, Milton D., 4,616,710, Cl. 169-41.000.

Corriu, Robert J.; Cerveau, Genevieve E.; Chuit, Claude G.; and Reye, Catherine, to Centre National de la Recherche Scientifique. Pentacoordinate silicon complexes, the process for their preparation and their application to the preparation of organosilanes. 4,617,413, Cl. 556-464.000.

Cortolano, Frank: *See—*
Steinberg, David H.; and Cortolano, Frank, 4,617,404, Cl. 549-90.000.

Costanzi, Silvestro; Traverso, Enrico; Podesta , Roberto; Gussoni, Damiano; and Busetto, Carlo, to Enichem Sintesi, S.p.A. Stabilized polyolefinic compositions and stabilizer compounds suitable to that purpose. 4,617,333, Cl. 524-96.000.

Cotrel, Claude: *See—*
Corbet, Jean-Pierre; Cotrel, Claude; Farge, Daniel; and Paris, Jean-Marc, 4,617,290, Cl. 514-11.000.
Corbet, Jean-Pierre; Cotrel, Claude; Farge, Daniel; and Paris, Jean-Marc, 4,617,377, Cl. 530-317.000.

Couch, Robert P., to United Technologies Corporation. Expanded classification sample in electrostatic engine diagnostics. 4,617,629, Cl. 364-431.020.

Couch, Robert P.: *See—*
Rosenbush, David M.; Zwicke, Philip E.; and Couch, Robert P., 4,617,631, Cl. 364-431.020.
Zwicke, Philip E.; Rosenbush, David M.; and Couch, Robert P., 4,617,628, Cl. 364-431.020.
Zwicke, Philip E.; Rosenbush, David M.; and Couch, Robert P., 4,617,630, Cl. 364-431.020.
Zwicke, Philip E.; Rosenbush, David M.; and Couch, Robert P., 4,617,632, Cl. 364-431.020.

Coughlin, Peter K., to Union Carbide Corporation. Catalyst for converting synthesis gas to liquid motor fuels. 4,617,283, Cl. 502-66.000.

Coughlin, Peter K.; and Rabo, Jule A., to Union Carbide Corporation. Enhanced conversion of syngas to liquid motor fuels. 4,617,320, Cl. 518-719.000.

Courbat, Pierre: *See—*
Albert, Alban; Courbat, Pierre; and Weith, Andre , 4,617,296, Cl. 514-100.000.

Courtoy, Jean-Francois; and Marchal, Daniel, to Eurofloor S.A. Process for obtaining areas of distinctive appearance on synthetic coverings and the product derived therefrom. 4,617,222, Cl. 428-142.000.

Coyle, Joseph P.: *See—*
Tsang, Peter H. S.; Coyle, Joseph P.; and Rhee, Seong K., 4,617,165, Cl. 264-236.000.

Cramer, Mina M., to Mina Manufacturing, Inc. Adjustable support assembly. 4,616,797, Cl. 248-230.000.

Crane Co.: *See—*
Carpenter, Richard G., 4,616,980, Cl. 417-357.000.

Crevling, Robert: *See—*
Berfield, Robert C.; and Crevling, Robert, 4,616,378, Cl. 15-353.000.

Crivello, James V.; and Eckberg, Richard P., to General Electric Company. Vinyloxy-functional organopolysiloxane compositions. 4,617,238, Cl. 428-452.000.

Crook, Evan H.: *See—*
Weese, Richard H.; Crook, Evan H.; and Liwak, Susan M., 4,617,329, Cl. 523-201.000.

Crookston, Ronald W.; and Dakin, Hayes O., Jr., to Electric Power Research Institute, Inc. Actuator for an electrical circuit interrupter. 4,617,436, Cl. 200-148.00R.

Crophandling Systems Limited: *See—*
Byers, Stuart D.; and Clark, John F., 4,616,465, Cl. 52-748.000.

Crosfield Electronics Limited: *See—*
MacDonald, Lindsay W., 4,617,592, Cl. 358-80.000.

Cryoblast, Inc.: *See—*
Moore, David E., 4,617,064, Cl. 134-7.000.

Culter, Robert G., to Tektronix, Inc. Autoconvergence of a cathode ray tube using a semiconductor detector. 4,617,495, Cl. 315-10.000.

Cunningham, Alton J.; and Hanson, Brian A., to Wesbar Corporation. Submersible tail light assembly. 4,617,617, Cl. 362-267.000.

Cunningham, James L.; and Campbell, Bonnie J., to Wolverine Tube, Inc. Apparatus for making heat exchange tubes. 4,616,391, Cl. 29-157.3AH.

Cushman, Robert H., to AT&T Technologies, Inc. Method and apparatus for gripping multilead articles. 4,616,414, Cl. 29-835.000.

Cuvilliers, Bernard; and Jourdain, Philippe, to U.S. Philips Corporation. High-frequency circuit comprising an integrated capacitor. 4,617,586, Cl. 357-80.000.

Dacor Corporation: *See—*
Pedersen, Vernon G.; and Martin, Michael, 4,616,645, Cl. 128-204.260.

Daicel Chemical Industries Ltd.: *See—*
Namikoshi, Hajime; and Ohmiya, Takeo, 4,617,385, Cl. 536-98.000.

Daido Metal Company Ltd.: *See—*
Mori, Sanae, 4,617,172, Cl. 420-530.000.

Daidousanso Co., Ltd.: *See—*
Yoshino, Akira, 4,617,040, Cl. 62-37.000.

Daimler-Benz Aktiengesellschaft: *See—*
Reichl, Bernhard; Maurath, Rudolf; Koch, Dieter; and Hametner, Gerhard, 4,616,841, Cl. 280-432.000.
Sacco, Bruno; Tomforde, Johann; Paschke, Joachim; and Leschke, Harald, 4,616,869, Cl. 296-1.00S.

Dainippon Screen Mfg. Co., Ltd.: *See—*
Nezu, Yasutada; Tamura, Yutaka; Mizuno, Yuuzi; Iwamoto, Hiroshi; Yokota, Akihiro; and Maeda, Kiyoshi, 4,617,578, Cl. 346-108.000.

Dakin, Hayes O., Jr.: *See—*
Crookston, Ronald W.; and Dakin, Hayes O., Jr., 4,617,436, Cl. 200-148.00R.

Dalrymple, Dwyann; and Vinson, Edward, to Halliburton Company. Method of altering the permeability of a hydrocarbon-containing subterranean formation. 4,617,132, Cl. 252-8.554.

Dalrymple, Monte J., to Zilog, Inc. High speed clocked, latched, and bootstrapped buffer. 4,617,476, Cl. 307-443.000.

da Mota, Augusto L. C., to Shell Oil Company. Riser tensioning system. 4,616,708, Cl. 166-355.000.

Dancoine, Daniel. Process and device for automatic sampling of bulk materials contained in transport vehicles. 4,616,515, Cl. 73-864.310.

Dane, John A. Bowl-shaped reflector members for parabolic reflectors. 4,616,909, Cl. 350-613.000.

Danesi, Pier R., to United States of America, Energy. Separations by supported liquid membrane cascades. 4,617,125, Cl. 210-638.000.

Dann, Lynn D., to Eastman Kodak Company. Clamping circuit for video signals. 4,617,590, Cl. 358-34.000.

Danroc, Joel: *See—*
Braun, Camille; Danroc, Joel; Francois, Bernard; and Michel, Jean, 4,617,158, Cl. 264-0.500.

Darken, Jeffrey, to OMI International Corporation. Formaldehyde-free autocatalytic electroless copper plating. 4,617,205, Cl. 427-305.000.

Dassel, Rudolf: *See—*
Knebel, Fritz; and Dassel, Rudolf, 4,616,536, Cl. 81-128.000.

Dassler, Armin A., to Puma-Sportschunfabriken Rudolf Dassler KG. Sport shoe sole, especially for running. 4,616,431, Cl. 36-28.000.

Data Conversion Inc.: *See—*
Hodges, Paul L.; and Duerr, David R., 4,616,473, Cl. 53-520.000.

Data Distribution Devices, Inc.: *See—*
Sheiman, Arthur E., 4,617,555, Cl. 340-531.000.

Data General Corporation: *See—*
Clark, Jeffrey S., 4,617,642, Cl. 364-900.000.

Davidson, Allen L., to Motorola, Inc. Method for obtaining a linear cellular array employing cosine-squared antenna patterns. 4,617,573, Cl. 343-844.000.

Davidson & Company Limited: *See—*
Gibson, Stanley; Tindall, Colin; and Graham, John, 4,617,451, Cl. 219-490.000.

Davis, Bill G., to Jetco, Inc. Valve. 4,616,806, Cl. 251-63.400.

Davis, Edgar A.; Dexter, Rose M.; and McCarthy, John D., to VSL Corporation. Protective apparatus for tendons in tendon tensioning anchor assemblies. 4,616,458, Cl. 52-230.000.

Davis, Richard K.; Roberts, Clayton R.; and Tehon, Stephen W., to General Electric Company. Active datum for coordinate reference in a numerically controlled machine tool. 4,617,503, Cl. 318-572.000.

Davis, Roy J. Ball-kicking assembly. 4,616,834, Cl. 273-411.000.

Davison, Thomas W.: *See—*
Fecht, David C.; and Davison, Thomas W., 4,617,019, Cl. 604-280.000.

Dayco Corporation: *See—*
Miranti, Joseph P., Jr.; Oliver, Larry R.; and Johnson, Clyde O., 4,617,007, Cl. 474-201.000.
Wetzel, Robert E.; and Marsh, Richard L., 4,617,075, Cl. 156-137.000.

Debo, Joseph G. Rocker safety boot. 4,616,873, Cl. 297-272.000.

de Briel, Jacques T.: *See—*
Jaccod, Michel; and de Briel, Jacques T., 4,617,005, Cl. 474-14.000.

DeBruyn, William, to Amerock Corporation. Vertically adjustable rotatable shelf assembly. 4,616,940, Cl. 384-248.000.

De Cock, Etienne M.: *See—*
Boeve, Gerard J.; and De Cock, Etienne M., 4,616,821, Cl. 271-213.000.

Degen, Peter J.: *See—*
Pall, David B.; Degen, Peter J.; and Gsell, Thomas C., 4,617,124, Cl. 210-638.000.

Deggendorfer Werft und Eisenbau Gesellschaft m.b.H.: *See—*
Weiss, Isidor, 4,616,587, Cl. 114-29.000.

Degussa Aktiengesellschaft: *See—*
Kuhn, Werner; and Zilske, Wolfgang, 4,617,096, Cl. 204-44.300.
Lippert, Bernhard; and Raudaschl, Gabriele, 4,617,410, Cl. 556-137.000.

Dehne, Clarence A., to Jervis B. Webb Company. Power and free conveyor systems. 4,616,570, Cl. 104-172.00B.

Deicke, Axel; and Tigges, Michael, to Bayerische Motoren Werke AG. Testing installation for electric circuits of a motor vehicle. 4,617,510, Cl. 324-51.000.

Deister Concentrator Company, Inc.: *See—*
Christophersen, John A.; Marquardt, Fred J.; and Zipperian, Donald E., 4,617,113, Cl. 209-170.000.

De Jong, Hendrikus: *See—*
Rocholl, Johan P.; and De Jong, Hendrikus, 4,617,339, Cl. 524-514.000.

Dekura, Hitoshi: *See—*
Futaki, Kenji; and Dekura, Hitoshi, 4,617,661, Cl. 371-20.000.

Delia, Anthony F.: *See—*
Ball, Lewis C.; and Delia, Anthony F., 4,616,558, Cl. 98-40.110.

Demange, Michel; and Septier, Louis, to Societe Francaise d'Electrometallurgie-SOFREM. Process and apparatus for mouiding ingots of ferro-alloys by chill casting in a cooled copper mould. 4,616,690, Cl. 164-128.000.

Denis, Jean-Pierre, to Pont-A-Mousson S.A. Foundry moulding process and mould using a pattern of gasifiable material surrounded by sand free of a binding agent for low pressure precision casting. 4,616,689, Cl. 164-34.000.

DePaolis, Michael V., Jr., to AT&T Bell Laboratories. Symmetrical output complementary buffer. 4,617,477, Cl. 307-443.000.

de Salaberry, Bernard: *See—*
Bernelin, Bernard; and de Salaberry, Bernard, 4,616,929, Cl. 356-350.000.

DeShong, George T.: *See—*
Doutrich, Ray C.; and DeShong, George T., 4,616,415, Cl. 29-857.000.

DeSoto, Inc.: *See—*
Sekmakas, Kazys; and Shah, Raj, 4,617,364, Cl. 526-263.000.

Dessauges, Gerald: *See—*
Pallie, Kemal D.; and Dessauges, Gerald, 4,617,357, Cl. 525-506.000.

Detriche, Jean-Marie, to Commissariat a l'Energie Atomique. Positioning device. 4,617,504, Cl. 318-576.000.

Detroit Stoker Company: *See—*
Giaier, Thomas A.; Johnson, Neil H.; Reschly, David C.; Knox, Harold L.; and Spurlock, Kim E., 4,616,573, Cl. 110-327.000.

Deutsch Fastener Corp.: *See—*
Molina, Jorge W., 4,616,967, Cl. 411-105.000.

Deutscher, Klaus: *See—*
Broemer, Heinz; Deutscher, Klaus; Franek, Henning; and Reck, Ralf, 4,617,024, Cl. 623-10.000.

Deutschmann, Herbert; and Wolters, Gerd-Michael, to MTU Motoren- und Turbinen-Union Friedrichshafen GmbH. Control system for the engagement and disengagement of an exhaust gas turbocharger. 4,616,480, Cl. 60-600.000.

Deutz-Allis Corporation: *See—*
Hanaway, Roger D.; and Breyer, Randall E., 4,616,661, Cl. 130-27.03T.

DeVault, Birch L.: *See—*
Kellogg, Walter J.; DeVault, Birch L.; and Paape, Kenneth L., 4,617,546, Cl. 337-170.000.

Devensky, Walter L.; and Dube, Carlos M., to Allied Corporation. Apparatus for detecting and recovering binary data from an input signal. 4,617,678, Cl. 375-102.000.

Devices for Vascular Intervention: *See—*
Simpson, John B., 4,616,648, Cl. 128-303.00R.

Dew, James T.: *See—*
Krivak, Thomas G.; Heimburger, Stanley A.; and Dew, James T., 4,617,294, Cl. 514-52.000.

De Woskin, Irvin S. Identification band. 4,616,436, Cl. 40-21.00C.

Dexter, Rose M.: *See—*
Davis, Edgar A.; Dexter, Rose M.; and McCarthy, John D., 4,616,458, Cl. 52-230.000.

Diafoil Company, Limited: *See—*
Kanesaki, Tateo; and Utsumi, Shigeo, 4,617,164, Cl. 264-235.800.

Diamond, Anthony E., to Teleplex Corporation. Addressable-port, daisy chain telemetry system with self-test capability. 4,617,566, Cl. 340-870.110.

Dickerson, James W.; and Smith, William N., III, to AGILE Systems. Data communication system. 4,617,423, Cl. 178-2.00R.

Dickie, Ray A.; and Qaderi, Saiyed B. A., to Ford Motor Company. Crosslinkable composition comprising modified aminoepoxy resins-II. 4,617,348, Cl. 525-112.000.

Didde-Glaser, Inc.: *See—*
Faddis, Terry N.; and Ensminger, Glen H., 4,616,564, Cl. 101-143.000.

Dietzsch, Kurt; and Witzel, Karlheinz, to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG. Heating and/or air conditioning apparatus for automotive vehicles. 4,616,693, Cl. 165-41.000.

Digital Equipment Corporation: *See—*
Wu, Andrew L., 4,617,193, Cl. 427-38.000.

DiLorenzo, Neil: *See—*
Morley, Edmond; DiLorenzo, Neil; and Karras, James, 4,616,474, Cl. 53-556.000.

Dilts, David A.; and Brauneck, Timothy W., to Standard Oil Company, The. Flexible, interconnected array of amorphous semiconductor photovoltaic cells. 4,617,420, Cl. 136-244.000.

DiMarchi, Richard D.; and Shaar, Carl J., to Eli Lilly and Company. Growth hormone release factor analogs. 4,617,149, Cl. 530-324.000.

Dimov, Dobromir I., heir: *See—*
Nikolov, Ivan D., deceased; Dimova, Vassilka P., heir; Dimov, Dobromir I., heir; Dimov, Petar I., heir; Marinov, Marin I.; Peytchev, Ivan M.; Rashev, Tzolo V.; and Tchorbov, Iliya G., 4,616,808, Cl. 266-207.000.

Dimov, Petar I., heir: *See—*
Nikolov, Ivan D., deceased; Dimova, Vassilka P., heir; Dimov, Dobromir I., heir; Dimov, Petar I., heir; Marinov, Marin I.; Peytchev, Ivan M.; Rashev, Tzolo V.; and Tchorbov, Iliya G., 4,616,808, Cl. 266-207.000.

Dimova, Vassilka P., heir: *See—*
Nikolov, Ivan D., deceased; Dimova, Vassilka P., heir; Dimov, Dobromir I., heir; Dimov, Petar I., heir; Marinov, Marin I.; Peytchev, Ivan M.; Rashev, Tzolo V.; and Tchorbov, Iliya G., 4,616,808, Cl. 266-207.000.

Dingeldein, Elvira: *See—*
Wahlig, Helmut; Dingeldein, Elvira; Kirchlechner, Richard; Orth, Dieter; and Rogalski, Werner, 4,617,293, Cl. 514-41.000.

Dinucci, Dennis J.: *See—*
Bevilacqua, Bruce W.; Klug, Ralph W.; Carlsen, David C.; and Dinucci, Dennis J., 4,616,498, Cl. 72-53.000.

DiPietro, Dawn M., to Procter & Gamble Company, The. Improved deodorant stick. 4,617,185, Cl. 424-65.000.

DiPietro, Matthew; and Maslanka, Daniel C., to Eastman Kodak Company. Film video player/printer. 4,616,926, Cl. 355-45.000.

Dirks, Rolf: *See—*
Mooz, Dietrich; and Dirks, Rolf, 4,617,544, Cl. 337-3.000.

Dismukes, Newton B. Casing lateral wells. 4,616,719, Cl. 175-94.000.

Dispovet: *See—*
Leger, Claude, 4,616,428, Cl. 36-7.10R.

Dmytriw, Walter. Fishing float. 4,616,441, Cl. 43-44.910.

Dobbins, Frederick A.: *See—*
Owensby, Joseph E.; Dobbins, Frederick A.; and Austin, Billy W., 4,616,472, Cl. 53-459.000.

Dobkin, Milton B.; and Louie, Robert E., to Miles Laboratories, Inc. High titer cytomegalovirus immune serum globulin. 4,617,379, Cl. 530-388.000.

Dockner, Toni; Hagen, Helmut; and Krug, Herbert, to BASF Aktiengesellschaft. Preparation of quinolines. 4,617,395, Cl. 546-178.000.

Doe, Lester A., Jr., to R. T. Vanderbilt Company, Inc. Dicocoamine derivatives of 2,5-dimercapto-1,3,4-thiadiazole. 4,617,136, Cl. 252-47.000.

Doerfling, Ralph A.: *See—*
Scourtes, Constantine C.; and Doerfling, Ralph A., 4,616,800, Cl. 249-4.000.

Doi, Shuhei: *See—*
Oonishi, Akiyoshi; Doi, Shuhei; and Shimada, Takeo, 4,617,365, Cl. 526-265.000.

Dola, Frank P., to AMP Incorporated. Network interface device. 4,616,897, Cl. 339-122.00R.

Dolak, Terence M.: *See—*
Martin, Tellis A.; and Dolak, Terence M., 4,617,291, Cl. 514-19.000.

Dolansky, Franz; and Steiner, Ewald, to Siemens Aktiengesellschaft. Protective plug for distributor strips. 4,617,602, Cl. 361-119.000.

Domagala, John M.: *See—*
Mich, Thomas F.; and Domagala, John M., 4,617,308, Cl. 514-312.000.

Donaldson Company, Inc.: *See—*
Kruse, Barbara L.; Gronli, Darrell D.; and Gronholz, Donald D., 4,617,122, Cl. 210-493.300.

Dopp, Robert B., to Rayovac Corporation. Organic siliconate additive for alkaline zinc electrochemical cells. 4,617,242, Cl. 429-27.000.

Douglas, Jack E., to Hardware & Systems Patents Limited. Fasteners for doors, windows and the like. 4,616,864, Cl. 292-336.300.

Dourille, Alain: *See—*
Melchior, Jean; Andre, Thierry; and Dourille, Alain, 4,616,481, Cl. 60-606.000.

Doutrich, Ray C.; and DeShong, George T., to Du Pont de Nemours, E. I., and Company. Electrical connector apparatus, and methods and apparatus for assembling same. 4,616,415, Cl. 29-857.000.

Dow Chemical Company, The: *See—*
Behrens, Hugh C., 4,617,200, Cl. 427-216.000.
Knobel, Thomas M.; Kennedy, Earl E.; and Walker, Mary A., 4,617,325, Cl. 521-105.000.
Lenz, Robert W.; and Behm, Dean T., 4,617,370, Cl. 528-191.000.

Dow Corning Corporation: *See*—
Plueddemann, Edwin P., 4,617,057, Cl. 106-2.000.
Downer, James R.: *See*—
Eisenhaure, David B.; Downer, James R.; Bliamptis, Tim E.; Oberbeck, George A.; and Hendrie, Susan D., 4,617,507, Cl. 322-4.000.
Dr.Ing. h.c.F. Porsche Aktiengesellschaft: *See*—
Bardoll, Meinrad, 4,616,674, Cl. 137-596.180.
Draftex Industries Limited: *See*—
Ginster, Helmut, 4,617,220, Cl. 428-122.000.
Draper Corporation: *See*—
Lai, Pepper Y., 4,616,680, Cl. 139-304.000.
Dreibelbis, John A., to Mallinckrodt, Inc. Silica catalyst supports. 4,617,060, Cl. 106-193.00R.
Dresser Industries, Inc.: *See*—
Fertl, Walter H., 4,617,517, Cl. 324-338.000.
Fox, Charles H., 4,616,736, Cl. 184-6.120.
Drygalski, Gordon T.; Otto, Dennis L.; and Ross, Donald K., to Chicago Rawhide Mfg. Co. Reverse lip positive venting seal. 4,616,836, Cl. 277-152.000.
Drynan, David S.; and Baker, David M., to Northern Telecom Limited. Transmitting sequence numbers of information in a packet data transmission system. 4,617,657, Cl. 370-60.000.
D'Sidocky, Richard M., to Goodyear Tire & Rubber Company, The. Sulfur curable silicone rubber. 4,617,347, Cl. 525-105.000.
D'Silva, Themistocles D. J., to Union Carbide Corporation. Pesticidal oxime N-alkyl-N-α-(alkylthio-phosphorothio)acyl carbamates. 4,617,295, Cl. 514-97.000.
DSM RIM Nylon VOF: *See*—
Gabbert, James D.; and Hedrick, Ross M., 4,617,355, Cl. 525-420.000.
Dube, Carlos M.: *See*—
Devensky, Walter L.; and Dube, Carlos M., 4,617,678, Cl. 375-102.000.
DuBois, Donald W., to PPG Industries, Inc. Method for treating cathode. 4,617,196, Cl. 427-123.000.
Dudley, Dana, to Texas Instruments Incorporated. Visible and near infrared imaging system. 4,617,593, Cl. 358-113.000.
Duerr, David R.: *See*—
Hodges, Paul L.; and Duerr, David R., 4,616,473, Cl. 53-520.000.
Duffy, John W.; Funke, Robert A.; and Shollenbarger, David W., to Fisher Controls International, Inc. High-low pressure pilot. 4,616,670, Cl. 137-84.000.
Duggleby, Peter M.: *See*—
Robb, Ian D.; and Duggleby, Peter M., 4,617,139, Cl. 252-135.000.
Dumas, Philip E.: *See*—
Stockel, Richard F.; and Dumas, Philip E., 4,617,189, Cl. 424-162.000.
Dumousseau, Jean-Yves: *See*—
Verdier, Jean-Michel; Jacubert, Serge; Grosbois, Jean; and Dumousseau, Jean-Yves, 4,617,098, Cl. 204-68.000.
Dunbobbin, Brian R.: *See*—
Brown, William R.; Cassano, Anthony A.; Dunbobbin, Brian R.; Rao, Pradip; and Erickson, Donald C., 4,617,182, Cl. 423-579.000.
Duncan, Dan, to General Electric Company. Diaphragm for a steam turbine. 4,616,975, Cl. 415-181.000.
Duncan Electronics: *See*—
Overcash, Donald A.; Hall, Lloyd E.; and Mueller, Guenter W., 4,616,504, Cl. 73-118.100.
Du Pont de Nemours, E. I., and Company: *See*—
Doutrich, Ray C.; and DeShong, George T., 4,616,415, Cl. 29-857.000.
Green, Frank, 4,616,375, Cl. 15-246.000.
Heckel, Thomas A., Jr.; and Rizzo, Felice J., 4,617,351, Cl. 525-199.000.
Huynh-Ba, Gia, 4,617,369, Cl. 528-128.000.
Nozaki, Hitosi; and Oshima, Koichiro, 4,617,153, Cl. 260-413.000.
Page, Matthew A.; Libbey, William J.; and Lundeen, Allan J., 4,617,352, Cl. 525-240.000.
Reap, James J., 4,617,388, Cl. 544-116.000.
Su, Aaron C. L., 4,617,363, Cl. 526-253.000.
DuRocher, Daniel J., to Methode Electronics, Inc. Ignition switch with self-adjusting headlamp dimmer. 4,617,437, Cl. 200-153.00P.
Dynamit Nobel AG: *See*—
Nestler, Heinz; and Barfurth, Dieter, 4,617,408, Cl. 556-40.000.
Dynamit Nobel Aktiengesellschaft: *See*—
Mewes, Heinz; Nachtigall, Wilhelm; Wienand, Michael, deceased; Wienand, Anneliese, legal representative; Wienand, Hans-Jurg W., heir; Wienand, Michael, heir; Wienand, Rudolf J., heir; Wienand, Karl F., heir; and Wienand, Elisabeth H. M., heir, 4,616,989, Cl. 425-203.000.
Dynapac AB: *See*—
Bueno, Alfredo, 4,616,882, Cl. 303-68.000.
Dziuba, Peter: *See*—
Ehrlinger, Friedrich; Katzorek, Karl-Hermann; Dziuba, Peter; Veser, Karl; and Caspar, Peter, 4,616,520, Cl. 74-325.000.
E. B. Eddy Forest Products Ltd.: *See*—
Gladish, Herbert E., 4,616,960, Cl. 406-88.000.
E.T.F. Enterprises, Inc.: *See*—
McQuiggin, John, 4,616,430, Cl. 36-14.000.
Eastman Kodak Company: *See*—
Dann, Lynn D., 4,617,590, Cl. 358-34.000.
DiPietro, Matthew; and Maslanka, Daniel C., 4,616,926, Cl. 355-45.000.
Matson, Gary R.; Pottle, Winston G.; and Soucy, Francis L., 4,616,921, Cl. 355-5.000.
Pruett, Wayne P.; Wang, Richard H. S.; Hilbert, Samuel D.; and Weaver, Max A., 4,617,373, Cl. 528-288.000.
Pruett, Wayne P.; Wang, Richard H. S.; Hilbert, Samuel D.; and Weaver, Max A., 4,617,374, Cl. 528-288.000.
Eaton Corporation: *See*—
Gindy, Sherif S.; and Tremonti, Ronald R., 4,616,511, Cl. 73-862.040.
Speranza, Donald, 4,617,620, Cl. 363-19.000.
Eccardt, Curtis J.; and Brundage, Richard B., to Emerson Electric Co. Walking beam scroll saw. 4,616,541, Cl. 83-98.000.
Echevin, Michel; Piegay, Yves; and Legrand, Maurice, to Skis Rossignol S.A.-Club Rossignol S.A. Ski. 4,616,842, Cl. 280-602.000.
Eckberg, Richard P.: *See*—
Crivello, James V.; and Eckberg, Richard P., 4,617,238, Cl. 428-452.000.
Economics Laboratory, Inc.: *See*—
Kirkwood, Marda K.; and Olson, Keith E., 4,617,272, Cl. 435-183.000.
Edwards, Harper, McNew and Company: *See*—
Edwards, John W.; Harper, Daniel R.; and McNew, Quinton B., 4,616,883, Cl. 305-40.000.
Edwards, John W.; Harper, Daniel R.; and McNew, Quinton B., to Edwards, Harper, McNew and Company. Endless drive system. 4,616,883, Cl. 305-40.000.
Egami, Tsuneyuki: *See*—
Saito, Kimitaka; Kohama, Tokio; Egami, Tsuneyuki; Saito, Tsutomu; Takahashi, Hiroshi; and Sato, Kunihiko, 4,616,619, Cl. 123-489.000.
Ehle, Joachim: *See*—
Fuchs, Gerhard; and Ehle, Joachim, 4,617,673, Cl. 373-80.000.
Ehrlinger, Friedrich; Katzorek, Karl-Hermann; Dziuba, Peter; Veser, Karl; and Caspar, Peter, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Arrangement of a brake in a wheel head equipped with reducing gear. 4,616,520, Cl. 74-325.000.
Eichenauer, Herbert; and Ott, Karl-Heinz, to Bayer Aktiengesellschaft. Process for the production of high molecular weight thermoplastic resins. 4,617,358, Cl. 526-81.000.
Eicken, Karl; Graf, Hermann; Gramlich, Walter; Sauter, Hubert; Rentzea, Costin; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, to BASF Aktiengesellschaft. 7-aminoazolo[1,5-a]pyrimidines and fungicides containing these. 4,617,303, Cl. 514-258.000.
Eidenschink, Rudolf; and Krause, Joachim, to Merck Patent Gesellschaft mit beschrankter Haftung. Bicyclohexyl derivatives. 4,617,140, Cl. 252-299.610.
Eisai Co., Ltd.: *See*—
Okuyama, Shinichi; Mishina, Hitoshi; Furuse, Kazumaro; and Murotani, Isao, 4,617,187, Cl. 424-94.000.
Eisenhaure, David B.; Downer, James R.; Bliamptis, Tim E.; Oberbeck, George A.; and Hendrie, Susan D., to Charles Stark Draper Laboratory, Inc., The. Self-regulating energy storage system. 4,617,507, Cl. 322-4.000.
Ekco Products, Inc.: *See*—
Alexander, Frederick D., 4,616,762, Cl. 220-74.000.
Ekdahl, Bengt: *See*—
Larsson, Leif; and Ekdahl, Bengt, 4,617,229, Cl. 428-284.000.
El Paso Hydrocarbons Company: *See*—
Mehra, Yuv R., 4,617,038, Cl. 62-17.000.
Electric Power Research Institute, Inc.: *See*—
Crookston, Ronald W.; and Dakin, Hayes O., Jr., 4,617,436, Cl. 200-148.00R.
Electro-Biology, Inc.: *See*—
Moore, John S., 4,616,629, Cl. 128-1.500.
Eli Lilly and Company: *See*—
DiMarchi, Richard D.; and Shaar, Carl J., 4,617,149, Cl. 530-324.000.
Ho, Peter P. K., 4,617,311, Cl. 514-353.000.
Maskalick, David G.; and Anderson, Marie T., 4,617,376, Cl. 530-308.000.
Robertson, David W., 4,617,302, Cl. 514-254.000.
Elissando, Bernard; Pereyre, Michel; and Quintard, Jean-Paul, to Centre National de la Recherche Scientifique. Aminomethyltriorganotin compounds, preferably α-mono or disubstituted; and the method of preparation. 4,617,409, Cl. 556-87.000.
Ellis, Ronald E.: *See*—
Gillett, Jimmie D.; Ellis, Ronald E.; and Robertson, Michael D., 4,616,485, Cl. 62-228.100.
Elmaleh, David R.; Levy, Shlomo; Shiue, Chyng-Yann; and Wolf, Alfred P., to United States of America, Energy. Process for the production of ^{18}F-2-deoxy-2-fluoro-D-glucose. 4,617,386, Cl. 536-122.000.
Ely, Richard I.: *See*—
Subbarao, Wunnava V.; and Ely, Richard I., 4,617,461, Cl. 250-229.000.
Emerson Electric Co.: *See*—
Eccardt, Curtis J.; and Brundage, Richard B., 4,616,541, Cl. 83-98.000.
Empire State Electric Energy Research Corp. (ESEERCO): *See*—
Abrams, Jack Z.; and Sherwin, Robert M., 4,616,574, Cl. 110-343.000.
Endo, Kazue: *See*—
Kawai, Yoshio; Kitagawa, Kiyoshi; Endo, Kazue; and Onodera, Chikau, 4,617,104, Cl. 204-301.000.

Engelhard, Gerhard; Pellkofer, Dieter; Bohm, Jurgen; and Forner, Siegfried, to Kraftwerk Union Aktiengesellschaft. Burner for wig welding. 4,617,444, Cl. 219-75.000.

Engstrom, Folke; Hakulin, Bertel K.; and Ruottu, Seppo K., to A. Ahlstrom Corporation. Combustion method. 4,616,576, Cl. 110-345.000.

Enichem Sintesi, S.p.A.: *See*—
Costanzi, Silvestro; Traverso, Enrico; Podesta , Roberto; Gussoni, Damiano; and Busetto, Carlo, 4,617,333, Cl. 524-96.000.

Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, to Voest-Alpine Aktiengesellschaft. Electric furnace arrangement. 4,617,672, Cl. 373-79.000.

Enshu Kogaku Seiki Company Limited: *See*—
Nakamura, Masakazu, 4,616,907, Cl. 350-552.000.

Ensminger, Glen H.: *See*—
Faddis, Terry N.; and Ensminger, Glen H., 4,616,564, Cl. 101-143.000.

Environmental Elements Corp.: *See*—
Walker, Kenneth A., 4,617,131, Cl. 210-794.000.

Epper, Wolfgang; and Florenz, Johannes, to Klockner-Humboldt-Deutz AG. Apparatus for the partial dehydration of sludge in the centrifuge field of a solid jacket centrifuge. 4,617,010, Cl. 494-52.000.

Epson Corporation: *See*—
Koto, Haruhiko; Okada, Junichi; Ishii, Hiroshi; and Sawada, Kenji, 4,617,581, Cl. 346-140.00R.

Erickson, Donald C.: *See*—
Brown, William R.; Cassano, Anthony A.; Dunbobbin, Brian R.; Rao, Pradip; and Erickson, Donald C., 4,617,182, Cl. 423-579.000.

Erico International Corporation: *See*—
Shaw, Richard G.; and Fahrer, Theodore J., 4,617,445, Cl. 219-98.000.

Ernst Leitz Wetzlar GmbH: *See*—
Broemer, Heinz; Deutscher, Klaus; Franek, Henning; and Reck, Ralf, 4,617,024, Cl. 623-10.000.

Ernst Stadelmann Gesellschaft m.b.H.: *See*—
Schleicher, Siegfried, 4,616,892, Cl. 312-330.00R.

Esmay, Edward N., to Bausch & Lomb Incorporated. Monoaxial coarse-fine adjusting mechanism for optical instruments, such as microscopes. 4,616,517, Cl. 74-10.450.

Esmil BV: *See*—
Klaren, Dick G., 4,616,698, Cl. 165-104.160.

Esposito, Christopher, to Four Seasons Solar Products Corp. Greenhouse construction provided with special ridge for ventilation. 4,616,560, Cl. 98-42.020.

Estes, Kerry S.: *See*—
Bodor, Nicholas S.; Estes, Kerry S.; and Simpkins, James W., 4,617,298, Cl. 514-176.000.

Ethicon, Inc.: *See*—
Golden, Donald M., 4,616,651, Cl. 128-325.000.

Eto, Masahiro: *See*—
Inoue, Fumio; Eto, Masahiro; and Kubota, Takashi, 4,617,591, Cl. 358-67.000.

Eurofloor S.A.: *See*—
Courtoy, Jean-Francois; and Marchal, Daniel, 4,617,222, Cl. 428-142.000.

Ewald, James L.: *See*—
Rodal, Jose J. A.; and Ewald, James L., 4,617,091, Cl. 162-343.000.

Exar Corporation: *See*—
Unerdem, M. Tarik, 4,617,535, Cl. 332-16.00R.

Exxon Production Research Co.: *See*—
Huffaker, Roger W.; and Stanton, Paul N., 4,616,706, Cl. 166-341.000.
Srnka, Leonard J., 4,617,518, Cl. 324-365.000.

Exxon Research and Engineering Co.: *See*—
Lang, Robert J., 4,617,027, Cl. 48-210.000.
Lundberg, Robert D.; Peiffer, Dennis G.; and Phillips, Robert R., 4,617,337, Cl. 524-399.000.
Shaub, Harold; and Waddey, Walter E., 4,617,026, Cl. 44-70.000.
Shaub, Harold, 4,617,134, Cl. 252-32.70E.
van der Vleugel, Dominicus J. M.; Hoving, Klaas; Wortel, Theodorus M.; Rosensweig, Ronald E.; and Rees Lovat V. C., 4,617,282, Cl. 502-66.000.

Eychaner, James. Pool light. 4,617,615, Cl. 362-216.000.

F.F. Seeley Nominees Pty. Ltd.: *See*—
Toohey, Kevin I., 4,616,563, Cl. 98-40.300.

Fabcon, Inc.: *See*—
Wood, Robert F.; and Vanderveer, William R., 4,616,489, Cl. 68-200.000.

Fabre, Andre : *See*—
Laurent, Jean; and Fabre, Andre , 4,616,703, Cl. 166-66.400.

Faddis, Terry N.; and Ensminger, Glen H., to Didde-Glaser, Inc. Modular offset lithographic printing tower. 4,616,564, Cl. 101-143.000.

Fahnestock, Stephen R., to Genex Corporation. Production of Protein A. 4,617,266, Cl. 435-68.000.

Fahrer, Theodore J.: *See*—
Shaw, Richard G.; and Fahrer, Theodore J., 4,617,445, Cl. 219-98.000.

Fairchild Camera and Instrument Corp.: *See*—
Matrone, John L., 4,616,971, Cl. 414-730.000.

Fairchild Semiconductor Corporation: *See*—
Vora, Madhukar B., 4,617,071, Cl. 148-188.000.

Falotico, Robert: *See*—
Bandurco, Victor T.; Bell, Stanley C.; Combs, Donald W.; and Falotico, Robert, 4,617,392, Cl. 544-250.000.

Fanuc Ltd.: *See*—
Kishi, Hajimu; Onuki, Tadayoshi; and Kurakake, Mitsuo, 4,617,640, Cl. 364-708.000.

Farese, Virgil A.; Grover, Fred C.; Moore, Steve R.; and Gilfillan, Robert W., to Perini Corporation. Railroad track fixation method and apparatus. 4,616,395, Cl. 29-460.000.

Farge, Daniel: *See*—
Corbet, Jean-Pierre; Cotrel, Claude; Farge, Daniel; and Paris, Jean-Marc, 4,617,290, Cl. 514-11.000.
Corbet, Jean-Pierre; Cotrel, Claude; Farge, Daniel; and Paris, Jean-Marc, 4,617,377, Cl. 530-317.000.

Faria, Carl R.; and Snouse, Thomas W., to Thermionics Laboratory, Inc. Seal structure for metal vacuum joint. 4,616,860, Cl. 285-336.000.

Fartmann, Norbert: *See*—
Bober, Helmut; Buthe, Theo; Coenen, Karl; Fartmann, Norbert; Herbertz, Klaus; Koch, Heinz; Kretschmer, Horst; Nienhaus, Clemens; Schardt, Peter; Schibrowski, Jurgen; and Schmandt, Willi, 4,617,003, Cl. 464-48.000.

Fazzolari, Anthony; and Fazzolari, Nicholas. Shrouded track slide bolt. 4,616,493, Cl. 70-129.000.

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Fecht, David C.; and Davison, Thomas W., to Sherwood Medical Company. Catheter. 4,617,019, Cl. 604-280.000.

Feldman, Steven, to AMP Incorporated. Surface mount, miniature, bussing connector. 4,616,893, Cl. 339-14.00R.

Feldmuhle Aktiengesellschaft: *See*—
Habert, Guy; and Kraft, Harald, 4,616,963, Cl. 407-114.000.

Feller, Murray F. Flow detectors. 4,616,509, Cl. 73-861.050.

Fellinger, Michael W.: *See*—
Chu, Raymond D.; Rubner, Anthony C.; and Fellinger, Michael W., 4,617,637, Cl. 364-505.000.

Felten & Guilleaume Energietechnik GmbH: *See*—
Mooz, Dietrich; and Dirks, Rolf, 4,617,544, Cl. 337-3.000.

Ferag AG: *See*—
Stauber, Hans-Ulrich, 4,616,816, Cl. 270-58.000.

Fergason, James L., to Manchester R & D Partnership. Encapsulated liquid crystal and method. 4,616,903, Cl. 350-334.000.

Ferranti plc: *See*—
Fox, Ronald W., 4,617,521, Cl. 329-50.000.

Ferro Manufacturing Corporation: *See*—
McFalls, Bob L.; and Tighe, William R., 4,616,875, Cl. 297-325.000.

Fertl, Walter H., to Dresser Industries, Inc. Determination of water saturation in earth formations independent of lithology. 4,617,517, Cl. 324-338.000.

Fetzer, Hans: *See*—
von Rex, Wolff G.; and Fetzer, Hans, 4,617,162, Cl. 264-176.00R.

Feuillerat, Jean: *See*—
Serrano, Jean-Pierre; and Feuillerat, Jean, 4,616,779, Cl. 239-79.000.

Feutrel, Claude, to Commissariat a l'Energie Atomique. Device for fixing a guide tube in a recess on the end fitting of a nuclear reactor fuel assembly. 4,617,171, Cl. 376-446.000.

Fichtel & Sachs AG: *See*—
Tomm, Dagwin; Kolb, Dieter; Gehrig, Siegmund; and Meyer, Alfred, 4,616,744, Cl. 192-109.00R.

Filtration Water Filters for Agriculture and Industry, Ltd.: *See*—
Barzuza, Ytzhak; and Lerner, Boaz, 4,617,120, Cl. 210-409.000.

Finegold, Hyman B., to Globe Tool & Engineering Co., The. Method and apparatus for winding dynamoelectric devices. 4,616,788, Cl. 242-7.030.

Finike Italiana Marposs S.p.A.: *See*—
Golinelli, Guido, 4,616,420, Cl. 33-172.00E.

Finlayson, John W.: *See*—
Boyers, Charles L.; and Finlayson, John W., 4,616,987, Cl. 425-89.000.

First Byte: *See*—
Sprague, Richard P., 4,617,645, Cl. 365-45.000.

First National Bank of Boston, The: *See*—
Stoller, Milton, 4,616,657, Cl. 128-664.000.

Fischer, Dina: *See*—
Rubinstein, Menachem; Friedlander, Jossef; and Fischer, Dina, 4,617,378, Cl. 530-351.000.

Fischer, Stuart G.: *See*—
Tomblin, Graham J.; Wexler, Karen B.; Ford, John P.; and Fischer, Stuart G., 4,617,102, Cl. 204-299.00R.

Fisher Controls International, Inc.: *See*—
Duffy, John W.; Funke, Robert A.; and Shollenbarger, David W., 4,616,670, Cl. 137-84.000.

Fisher, Gary H.; and Padgett, H. Pat, to Industrial Sheet Metal & Mechanical Corporation. Air-conditioning system. 4,616,777, Cl. 236-44.00C.

Fitz, Charles R.: *See*—
Harwood-Nash, Derek C.; Fitz, Charles R.; Zouch, Edward T.; and Smith, John M., 4,616,814, Cl. 269-328.000.

Fitzpatrick, Brian J.; and Harnack, Phyllis M., to North American Philips Corporation. Cathode ray tube device with improved color filtering system. 4,617,490, Cl. 313-478.000.

Flammini, John T. Non-contact type ring setter and sensor for use therewith. 4,616,409, Cl. 29-705.000.

Flier, Gustav, to Lingner & Fischer GmbH. Discharge barrier for collapsible tubes. 4,616,768, Cl. 222-92.000.

Florenz, Johannes: *See—*
Epper, Wolfgang; and Florenz, Johannes, 4,617,010, Cl. 494-52.000.
FMC Corporation: *See—*
Plummer, Ernest L., 4,617,316, Cl. 514-438.000.
Fohl, Artur, to TRW Repa GmbH. Fitting for a safety belt for motor vehicles. 4,616,878, Cl. 297-483.000.
Foltz, Carl L., to Hailey-Roberts Corporation. Visual pressure indicator for endotracheal cuff. 4,617,015, Cl. 604-100.000.
Forbes, Hampton E., Jr., to Westvaco Corporation. Sleeve for promotional products. 4,616,751, Cl. 206-485.000.
Ford, John P.: *See—*
Tomblin, Graham J.; Wexler, Karen B.; Ford, John P.; and Fischer, Stuart G., 4,617,102, Cl. 204-299.00R.
Ford, Michael E.; and Johnson, Thomas A., to Air Products and Chemicals, Inc. Polyalkylene polyamines via vapor phase reaction. 4,617,418, Cl. 564-479.000.
Ford Motor Company: *See—*
Dickie, Ray A.; and Qaderi, Saiyed B. A., 4,617,348, Cl. 525-112.000.
Ma, Thomas T., 4,616,606, Cl. 123-90.170.
Seiler, Wayne H., 4,617,116, Cl. 210-137.000.
Ward, Marcus J. S., 4,616,862, Cl. 292-201.000.
Foreman, Douglas: *See—*
Smith, Franklin W., 4,617,501, Cl. 318-459.000.
Forner, Siegfried: *See—*
Engelhard, Gerhard; Pellkofer, Dieter; Bohm, Jurgen; and Forner, Siegfried, 4,617,444, Cl. 219-75.000.
Forsen, Ivan, to Inogon Licens AB. Sight means. 4,616,421, Cl. 33-233.000.
Foshee, William R.: *See—*
Best, Walter E.; and Foshee, William R., 4,616,394, Cl. 29-436.000.
Foster, Edward B.: *See—*
Bowlds, Daniel P.; and Foster, Edward B., 4,617,531, Cl. 331-96.000.
Foster, Wayne G.: *See—*
Thompson, Kenneth J.; Rosenquist, Joel C.; and Foster, Wayne G., 4,616,820, Cl. 271-189.000.
Four Seasons Solar Products Corp.: *See—*
Esposito, Christopher, 4,616,560, Cl. 98-42.020.
Fox, Charles H., to Dresser Industries, Inc. Oil system for contiguous gear boxes. 4,616,736, Cl. 184-6.120.
Fox, David A., to Westinghouse Electric Corp. Switching time correction circuit for electronic inverters. 4,617,622, Cl. 363-98.000.
Fox, Ronald W., to Ferranti plc. Sample and hold demodulator with feedback for reduced riffle. 4,617,521, Cl. 329-50.000.
Fram Industrial Ltd.: *See—*
Smart, Michael F., 4,617,118, Cl. 210-232.000.
Francois, Bernard: *See—*
Braun, Camille; Danroc, Joel; Francois, Bernard; and Michel, Jean, 4,617,158, Cl. 264-0.500.
Franek, Henning: *See—*
Broemer, Heinz; Deutscher, Klaus; Franek, Henning; and Reck, Ralf, 4,617,024, Cl. 623-10.000.
Franklin, William N. Low energy consumption air conditioning system. 4,616,487, Cl. 62-235.100.
Freeman, Roger L.: *See—*
Hynes, Maurice A.; and Freeman, Roger L., 4,616,979, Cl. 417-231.000.
Freisinger, Henry; Luschnig, Franz; Stritzl, Karl; and Zotter, Johann, to TMC Corporation. Release ski binding. 4,616,843, Cl. 280-618.000.
Freitag, Dieter; Bottenbruch, Ludwig; and Hucks, Uwe, to Bayer Aktiengesellschaft. Process for the production of colorless aromatic polyester and polyester carbonates. 4,617,368, Cl. 528-126.000.
French State: *See—*
Melchior, Jean; Andre, Thierry; and Dourille, Alain, 4,616,481, Cl. 60-606.000.
Fresenius, Eduard: *See—*
Mathieu, Bernd, 4,617,119, Cl. 210-321.300.
Frey, Mark W.; King, Dallas E.; and Staker, William C., to General Motors Corporation. Remote actuator. 4,616,527, Cl. 74-625.000.
Friedlander, Jossef: *See—*
Rubinstein, Menachem; Friedlander, Jossef; and Fischer, Dina, 4,617,378, Cl. 530-351.000.
Fries, Carl J., Jr., to International Paper Company. Method and apparatus for skiving and hemming. 4,617,211, Cl. 428-35.000.
Frisbie, Jeffrey S.: *See—*
Samson, Wilfred J.; and Frisbie, Jeffrey S., 4,616,653, Cl. 128-344.000.
Froome, Beresford E. Portable backyard crab cooker or steamer. 4,616,625, Cl. 126-25.00R.
Frowein, Herbert: *See—*
Heinzl, Burno; Frowein, Herbert; Stiegler, Hartmut; Wurz, Joachim; Schmidt, Horst; Huttel, Willi; and Schmitz, Karl-Heinz, 4,616,754, Cl. 211-71.000.
Fru-Con Construction Corporation: *See—*
Werthessen, Nicholas H., 4,616,958, Cl. 405-246.000.
Fuchs, Gerhard; and Ehle, Joachim, to Fuchs Systemtechnik GmbH. Electric arc furnace having a space provided on one side of the furnace vessel for accommodating charging material. 4,617,673, Cl. 373-80.000.
Fuchs Systemtechnik GmbH: *See—*
Fuchs, Gerhard; and Ehle, Joachim, 4,617,673, Cl. 373-80.000.
Fuji Electric Co., Ltd.: *See—*
Kuroki, Kazuo, 4,617,621, Cl. 363-71.000.
Fuji Jukogyo Kabushiki Kaisha: *See—*
Abe, Kunihiro, 4,616,614, Cl. 123-339.000.
Fuji Kogyo Co., Ltd.: *See—*
Ohmura, Ryuichi, 4,616,438, Cl. 43-24.000.
Fuji Photo Film Co., Ltd.: *See—*
Aonuma, Masashi; and Tamai, Yasuo, 4,617,234, Cl. 428-328.000.
Horikawa, Kazuo, 4,617,470, Cl. 250-561.000.
Nakakita, Eiji; Koike, Akinobu; Sekiya, Toshiyuki; Misu, Hiroshi; and Kita, Nobuyuki, 4,617,250, Cl. 430-175.000.
Ogawa, Tadashi; Nagaoka, Satoshi; and Ohashi, Yuichi, 4,617,259, Cl. 430-569.000.
Sawada, Satoru; and Ukai, Toshinao, 4,617,257, Cl. 430-560.000.
Shiraishi, Hisashi; Kato, Hisatoyo; and Miyahara, Junji, 4,617,468, Cl. 250-484.100.
Yamaguchi, Nobutaka; Utumi, Masahiro; Fujiyama, Masaaki; and Miyoshi, Takahito, 4,617,226, Cl. 428-216.000.
Fuji Photo Optical Co., Ltd.: *See—*
Arakawa, Satoshi, 4,616,630, Cl. 128-4.000.
Fujimoto, Sakae: *See—*
Takahashi, Keiji; and Fujimoto, Sakae, 4,617,577, Cl. 346-76.0PH.
Fujimura, Naoto: *See—*
Tanaka, Shigemori; Sumino, Fumio; Kubo, Keiji; Hisamura, Masafumi; Toma, Hitoshi; and Fujimura, Naoto, 4,617,245, Cl. 430-58.000.
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., to International Flavors & Fragrances Inc. Organoleptic uses of tertiary hydroxyl carboxaldehydes. 4,617,144, Cl. 252-522.00A.
Fujita, Masafumi: *See—*
Saijo, Takao; Saito, Takanori; Kamimura, Kuniaki; and Fujita, Masafumi, 4,616,925, Cl. 355-44.000.
Fujita, Takashi: *See—*
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Fujitsu Limited: *See—*
Matsuzaki, Yasuro; Fukushima, Toshitaka; and Ueno, Kouji, 4,617,653, Cl. 365-230.000.
Sakamoto, Yasuhiko, 4,617,660, Cl. 371-13.000.
Suzuki, Atsushi, 4,617,529, Cl. 331-57.000.
Yoshizaki, Tsutomu; and Ishii, Toshimasa, 4,616,895, Cl. 339-17.0CF.
Fujiwara, Hitoshi; and Futagawa, Yoshikiyo, to Seiko Epson Kabushiki Kaisha. Liquid crystal display device. 4,617,563, Cl. 340-784.000.
Fujiyama, Masaaki: *See—*
Yamaguchi, Nobutaka; Utumi, Masahiro; Fujiyama, Masaaki; and Miyoshi, Takahito, 4,617,226, Cl. 428-216.000.
Fukahori, Hidehiko: *See—*
Suzuki, Masayuki; Fukahori, Hidehiko; Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; and Ohara, Tsunemasa, 4,616,913, Cl. 354-173.100.
Fukatsu, Tsunehiko: *See—*
Furuya, Kunitaka; Inagaki, Hiromi; Koga, Kiyoshi; Yorita, Masaru; Fukatsu, Tsunehiko; and Matsuura, Kazuo, 4,616,846, Cl. 280-673.000.
Fukuda, Hasatoshi, to Victor Company of Japan, Ltd. Feedback type comb filter. 4,617,588, Cl. 358-31.000.
Fukuda, Shinichi: *See—*
Kojima, Yuichi; and Fukuda, Shinichi, 4,617,552, Cl. 340-347.0DD.
Fukuda, Takemi: *See—*
Tahara, Tetsuya; Hayano, Kiyoharu; Setoguchi, Michihide; and Fukuda, Takemi, 4,617,314, Cl. 514-422.000.
Fukuda, Yoshiaki: *See—*
Ueki, Toru; Fukuda, Yoshiaki; Usami, Katsuyuki; and Kanasaki, Kazuharu, 4,617,207, Cl. 428-1.000.
Fukuda, Yoshio: *See—*
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Fukui, Masahiro: *See—*
Inoue, Hiromichi; Inukai, Takashi; Goto, Yasuyuki; Sato, Hideo; and Fukui, Masahiro, 4,617,141, Cl. 252-299.630.
Fukuma, Toshiaki: *See—*
Suzuki, Kiyosuke; Fukuma, Toshiaki; and Sato, Tatsuru, 4,617,247, Cl. 430-81.000.
Fukunaga, Shinobu: *See—*
Kyomasu, Mikio; Araki, Toshiyuki; Fukunaga, Shinobu; and Shindo, Masahiro, 4,617,649, Cl. 365-189.000.
Fukushima, Toshitaka: *See—*
Matsuzaki, Yasuro; Fukushima, Toshitaka; and Ueno, Kouji, 4,617,653, Cl. 365-230.000.
Funk, Edward W.; Kulkarni, Sudhir S.; and Chang, Y. Alice, to UOP Inc. Membrane separation of hydrocarbons. 4,617,126, Cl. 210-651.000.
Funke, Robert A.: *See—*
Duffy, John W.; Funke, Robert A.; and Shollenbarger, David W., 4,616,670, Cl. 137-84.000.
Funyu, Isao: *See—*
Fuyama, Moriaki; Tamura, Katsumi; Funyu, Isao; Nunokawa, Isao; Hanazono, Masanobu; and Hirastuka, Shigetoshi, 4,617,575, Cl. 346-76.0PH.
Furse, John H., to Smith International, Inc. Packer Mill. 4,616,721, Cl. 175-320.000.
Furuse, Kazumaro: *See—*
Okuyama, Shinichi; Mishina, Hitoshi; Furuse, Kazumaro; and Murotani, Isao, 4,617,187, Cl. 424-94.000.
Furuya, Akira: *See—*
Katsumata, Ryoichi; and Furuya, Akira, 4,617,267, Cl. 435-91.000.
Furuya, Kunitaka; Inagaki, Hiromi; Koga, Kiyoshi; Yorita, Masaru; Fukatsu, Tsunehiko; and Matsuura, Kazuo, to Honda Giken Kogyo Kabushiki Kaisha. Control device for a suspension. 4,616,846, Cl. 280-673.000.

Fushimi, Keiko: *See—*
Ashikaga, Tadashi; Kamanaka, Yoshihide; and Fushimi, Keiko, 4,617,675, Cl. 375-22.000.
Futaba Denshi Kogyo K.K.: *See—*
Kishino, Takao; Marushima, Ikuo; and Kanetsuna, Nobumitsu, 4,617,491, Cl. 313-497.000.
Futagawa, Yoshikiyo: *See—*
Fujiwara, Hitoshi; and Futagawa, Yoshikiyo, 4,617,563, Cl. 340-784.000.
Futaki, Kenji; and Dekura, Hitoshi, to Kabushiki Kaisha Toshiba. Electronic copying machine. 4,617,661, Cl. 371-20.000.
Fuyama, Moriaki; Tamura, Katsumi; Funyu, Isao; Nunokawa, Isao; Hanazono, Masanobu; and Hirastuka, Shigetoshi, to Hitachi, Ltd. Thermal head. 4,617,575, Cl. 346-76.0PH.
G. D. Searle & Co.: *See—*
Collins, Paul W.; and Weier, Richard M., 4,617,411, Cl. 556-443.000.
Gabbert, James D.; and Hedrick, Ross M., to DSM RIM Nylon VOF. Cross-linked nylon block copolymers. 4,617,355, Cl. 525-420.000.
Gaddy, Donald E. Elevated bowhunters sight. 4,616,422, Cl. 33-265.000.
Gala, Babulal V.; and McGough, Gerald B., to GTE Communication Systems Corp. Telephone base adapted to facilitate both desk and wall mounting of telephone instrument. 4,617,428, Cl. 179-100.00C.
Galatha, Matthew J.; Iorio, David V.; and Robinson, Carl W., to International Business Machines Corporation. Printer frame assembly and method of assembly. 4,616,944, Cl. 400-692.000.
Galli, Graziano; Penzo, Lucio; and Pina, Felice, to Manuli Autoadesivi SpA. Process for the manufacturing of adhesive tapes. 4,617,199, Cl. 427-208.000.
Gambertoglio, Louis M., to Hughes Tool Company. Firing head for a tubing conveyed perforating gun. 4,616,718, Cl. 175-4.540.
Ganguly, Ashit K.: *See—*
Girijavallabhan, Viyyoor M.; Ganguly, Ashit K.; Patel, Naginbhai; and Liu, Yi-Tsung, 4,617,300, Cl. 514-192.000.
GAO Gesellschaft fur Automation und Organisation: *See—*
Obrecht, Werner; Haghiri-Tehrani, Yahya; and Hoppe, Joachim, 4,617,605, Cl. 361-220.000.
GAO Gesellschaft fur Automation und Organisation mbH: *See—*
Haghiri-Tehrani, Yahya; and Hoppe, Joachim, 4,617,216, Cl. 428-67.000.
Garg, Diwakar, to Air Products and Chemicals, Inc. Catalysts for coal liquefaction processes. 4,617,106, Cl. 208-418.000.
Gartner, Thierry: *See—*
Choquer, Jean; and Gartner, Thierry, 4,617,571, Cl. 343-744.000.
Gas Research Institute: *See—*
Hals, Finn A., 4,617,046, Cl. 65-134.000.
Stickler, David B., 4,617,042, Cl. 65-27.000.
Gaskell, David J., to Lucas Industries Public Limited Company. Fuel injection nozzles. 4,616,781, Cl. 239-124.000.
Gasper, Andrew, Jr.: *See—*
Bleau, Charles D.; Gasper, Andrew, Jr.; Perlini, Julius J.; and Stricker, Alfred A., 4,617,081, Cl. 156-443.000.
Gassner, Siegfried: *See—*
Pietzsch, Ludwig; Overlach, Knud; and Gassner, Siegfried, 4,616,723, Cl. 177-211.000.
Gatturna, Roland F.: *See—*
Nicholson, James E.; and Gatturna, Roland F., 4,616,656, Cl. 128-630.000.
Gavronski, Paul A.: *See—*
Oshefsky, Daniel J.; Gavronski, Paul A.; Vogt, Robert E.; and Rajala, Gregory J., 4,617,082, Cl. 156-447.000.
GCA Corporation: *See—*
King, Michael C., 4,616,908, Cl. 350-576.000.
Gebr. Isringhausen: *See—*
Pietsch, Helge; Rink, Manfred; and Suss, Christian, 4,616,874, Cl. 297-321.000.
Gehl Company: *See—*
Burrough, Donald E.; and Viesselmann, Kim P., 4,616,961, Cl. 406-99.000.
Gehly, Joel C., to American Sterilizer Company. Reflector for multiple source lighting fixture. 4,617,619, Cl. 362-804.000.
Gehrig, Siegmund: *See—*
Tomm, Dagwin; Kolb, Dieter; Gehrig, Siegmund; and Meyer, Alfred, 4,616,744, Cl. 192-109.00R.
Geiger, Istvan; and Waschatz, Uwe, to Volkswagenwerk Aktiengesellschaft. Method and arrangement for combustion chamber identification in an internal combustion engine. 4,616,617, Cl. 123-436.000.
Geller, David A., to Wico Corporation. Target shooting game with photoelectric orientation sensing apparatus. 4,616,833, Cl. 273-313.000.
GenCorp Inc.: *See—*
Kuan, Tiong H., 4,617,212, Cl. 428-36.000.
General Electric Company: *See—*
Bloomer, Milton D., 4,617,508, Cl. 323-237.000.
Bowlds, Daniel P.; and Foster, Edward B., 4,617,531, Cl. 331-96.000.
Bryant, David V., 4,617,430, Cl. 179-146.00R.
Bullock, Donald F.; Wilson, Austin F.; Lemay, Marshall A.; and Miles, David B., 4,617,514, Cl. 324-137.000.
Cole, Herbert S., Jr.; Liu, Yung S.; and Philipp, Herbert R., 4,617,085, Cl. 156-643.000.
Crivello, James V.; and Eckberg, Richard P., 4,617,238, Cl. 428-452.000.
Davis, Richard K.; Roberts, Clayton R.; and Tehon, Stephen W., 4,617,503, Cl. 318-572.000.
Duncan, Dan, 4,616,975, Cl. 415-181.000.
Greenhalgh, Milton S., 4,617,454, Cl. 219-505.000.
Luthra, Krishan L., 4,617,492, Cl. 313-630.000.
Muralidharan, Ramachandran; and Rao, Atambir S., 4,617,168, Cl. 376-247.000.
Ray, Martin G.; and Harrold, Michael C., 4,617,028, Cl. 55-1.000.
Schenck, John F., 4,617,516, Cl. 324-318.000.
Sederel, Willem L., 4,617,345, Cl. 525-67.000.
General Instrument Corporation: *See—*
Tarbutton, Victor F.; Mitchell, J. Edwin; and Blumenkranz, Robert M., 4,617,522, Cl. 330-149.000.
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Schweitzer, David C., 4,616,906, Cl. 350-486.000.
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Frey, Mark W.; King, Dallas E.; and Staker, William C., 4,616,527, Cl. 74-625.000.
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Voss, Karl D., 4,616,691, Cl. 164-255.000.
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Auer, John H., Jr.; Sibley, Henry C.; and Stewart, Leslie C., 4,617,662, Cl. 371-25.000.
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Genest, Leonard J. Key operated electronic lock. 4,616,491, Cl. 70-276.000.
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Hornung, Klaus; Alt, Anton; Schulte, Gunter; and Mahnig, Fritz, 4,617,069, Cl. 148-138.000.
Jorn, Alfred, 4,616,508, Cl. 73-823.000.
George A. Mitchell Company: *See—*
Alexoff, Randall L., 4,616,500, Cl. 72-283.000.
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Gerber, Heinz J., to Gerber Scientific, Inc. Apparatus for working on woven fabric wound on a supply roll. 4,616,543, Cl. 83-175.000.
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Quinlan, Robert L., Jr.; and Lauro, Charles W., 4,616,824, Cl. 272-86.000.
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Adams, Norman R.; and Gifford, Charles A., 4,616,676, Cl. 137-636.400.
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Gillett, Jimmie D.; Ellis, Ronald E.; and Robertson, Michael D., to Ranco Electronics Division. Temperature controller for an air conditioning apparatus. 4,616,485, Cl. 62-228.100.
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Hill, Howard L.; and Gillum, Gary L., 4,616,986, Cl. 425-32.000.
Gin, Abram. Container for small consumer items, such as handbag, pouch, purse, box or the like, provided with alarm. 4,617,558, Cl. 340-574.000.
Gindy, Sherif S.; and Tremonti, Ronald R., to Eaton Corporation. Tactile sensor. 4,616,511, Cl. 73-862.040.
Ginster, Helmut, to Draftex Industries Limited. Sealing and trimming strips. 4,617,220, Cl. 428-122.000.
Giocastro, James. Vented heading for window unit. 4,616,561, Cl. 98-97.000.
Girardot, Michel; and Poldervaart, Leendert, to Single Buoy Moorings, Inc. Mooring buoy with individually floatable main body and turntable. 4,617,000, Cl. 441-3.000.
Girijavallabhan, Viyyoor M.; Ganguly, Ashit K.; Patel, Naginbhai; and Liu, Yi-Tsung, to Schering Corporation. 2(N-heterocyclyl) penems. 4,617,300, Cl. 514-192.000.
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Helmlinger, Daniel; Pesaro, Mario; and Klaus, Michael, 4,617,146, Cl. 252-522.00R.
Gladish, Herbert E., to E. B. Eddy Forest Products Ltd. Air conveyor components. 4,616,960, Cl. 406-88.000.
Glaser, Willy: *See—*
Lange, Gerd, 4,616,571, Cl. 108-111.000.
Glatt GmbH: *See—*
Nowak, Reinhard, 4,617,191, Cl. 426-294.000.
Glick, Sidney E. Telescoping roof structure. 4,616,451, Cl. 52-66.000.

Glincman, Mandel, to RCA Corporation. Analog-to-digital converters with virtual integration. 4,617,550, Cl. 340-347.0AD.

Globe Tool & Engineering Co., The: *See*—
Finegold, Hyman B., 4,616,788, Cl. 242-7.030.

Gloriod, Pierre; Audureau, Joel; and Pellegrini, Maurice, to Societe Chimique Des Charbonnages, S.A. Process for manufacturing ethylene terpolymers and ethylene copolymers. 4,617,366, Cl. 526-272.000.

Goel Anil, to Ashland Oil, Inc. Triols from bicyclic amide acetals. 4,617,391, Cl. 544-222.000.

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Goff, Charles W.; and Goff, Charles W., Jr., 4,616,555, Cl. 89-33.020.

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Goldowsky, Michael P., to North American Philips Corporation. Electrically releasable locking device. 4,617,448, Cl. 219-200.000.

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Gomes, Daniel. Knock down pivot fastener. 4,616,953, Cl. 403-407.100.

Goodman, James B. Multiple configuration memory circuit. 4,617,624, Cl. 364-200.000.

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D'Sidocky, Richard M., 4,617,347, Cl. 525-105.000.
Hill, Howard L.; and Gillum, Gary L., 4,616,986, Cl. 425-32.000.
Portalupi, Steven J.; and Riggs, Robert S., 4,617,074, Cl. 156-130.000.
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Buelens, Edward; and Goossens, Carolus C., 4,616,914, Cl. 354-277.000.

Gordon, Richard E., to National Patent Development Corporation. Medication compliance aid for unit dose packaging. 4,617,557, Cl. 340-568.000.

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Loren, Norman S.; and Gordon, William E., 4,616,866, Cl. 293-120.000.

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Gotkovsky, Bruno: *See*—
Iliou, Louis; and Gotkovsky, Bruno, 4,616,413, Cl. 29-832.000.

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Yano, Kazunori; Goto, Teruhisa; and Abe, Katsuhiro, 4,617,372, Cl. 528-216.000.

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Inoue, Hiromichi; Inukai, Takashi; Goto, Yasuyuki; Sato, Hideo; and Fukui, Masahiro, 4,617,141, Cl. 252-299.630.

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Bottcher, Henning; Gottschlich, Rudolf; Hausberg, Hans-Heinrich; Seyfried, Christoph; and Minck, Klaus-Otto, 4,617,309, Cl. 514-339.000.

Goyert, Wilhelm: *See*—
Haas, Peter; Barnes, James M.; and Goyert, Wilhelm, 4,617,387, Cl. 544-74.000.

Graco Inc.: *See*—
Quarve, Vernon K., 4,616,982, Cl. 417-383.000.

Graf, Hermann: *See*—
Eicken, Karl; Graf, Hermann; Gramlich, Walter; Sauter, Hubert; Rentzea, Costin; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, 4,617,303, Cl. 514-258.000.

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Granzow, Robert H.; and Myers, Kimbrough I., to NCR Corporation. Teller-assisted, customer-operated ATM document cashing system. 4,617,457, Cl. 235-379.000.

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Leveque, Jean-Luc M.; and Gras, Gilbert J., 4,616,933, Cl. 356-416.000.

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Muller, Egbert; Grauel, Ingolf; and Stumpe, Werner, 4,616,881, Cl. 303-7.000.

Gray, Robert M., to Lockheed Corporation. Isothermal forging method. 4,616,499, Cl. 72-56.000.

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Joo, Louis A.; Tucker, Kenneth W.; and Shaner, Jay R., 4,617,053, Cl. 75-244.000.

Green, David T.; McGarry, Richard A.; and Smith, Graham, to United States Surgical Corporation. Apparatus for applying surgical clips. 4,616,650, Cl. 128-325.000.

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Green, Frank, to Du Pont de Nemours, E. I., and Company. Cleaning device for jet pipes in TiO_2 reactor. 4,616,375, Cl. 15-246.000.

Green, Michael J., to BP Chemicals Limited. Chemical process involving ethers and amines. 4,617,154, Cl. 558-450.000.

Green, Michael J., to BP Chemicals Limited. Catalysis using supported strong base catalysts. 4,617,281, Cl. 502-62.000.

Green, Michael J.; and Kleiner, Gerhard A., to BP Chemicals Limited. Transetherification process. 4,617,412, Cl. 556-446.000.

Greene, Blandford W.: *See*—
Karcher, Ralph E., Jr.; and Greene, Blandford W., 4,616,592, Cl. 118-202.000.

Greene, Roland M. Additive for electrolyte of lead-acid batteries. 4,617,244, Cl. 429-200.000.

Greenhalgh, Milton S., to General Electric Company. Thermal-sensitive insulating composition and method, and article and apparatus incorporating same. 4,617,454, Cl. 219-505.000.

Gregory, Truman L.: *See*—
Burrows, Larry N.; and Gregory, Truman L., 4,616,957, Cl. 405-179.000.

Griffen, Charles W.: *See*—
Salyer, Ival O.; and Griffen, Charles W., 4,617,332, Cl. 524-4.000.

Griggs, Calvin, to Richards Medical Company. Compression screw assembly. 4,616,638, Cl. 128-92.0BB.

Grimm, Michael J.; and Sehlmeyer, Trannie R., to Plastic Recycling Foundation, Inc. Method for the separation of a mixture of polyvinyl chloride and polyethylene terephtalate. 4,617,111, Cl. 209-4.000.

Grob, Ferdinand: *See*—
Blocher, Eberhard; Grob, Ferdinand; Schmidt, Peter-Jurgen; and Wahl, Josef, 4,616,618, Cl. 123-478.000.

Groenewegen, Martinus A., to U.S. Philips Corporation. Method of manufacturing helically wound filaments and filaments manufactured by means of this method. 4,616,682, Cl. 140-71.500.

Groner, Guy H. Electrical hidden movement game. 4,616,832, Cl. 273-238.000.

Gronholz, Donald D.: *See*—
Kruse, Barbara L.; Gronli, Darrell D.; and Gronholz, Donald D., 4,617,122, Cl. 210-493.300.

Gronli, Darrell D.: *See*—
Kruse, Barbara L.; Gronli, Darrell D.; and Gronholz, Donald D., 4,617,122, Cl. 210-493.300.

Grosbois, Jean: *See*—
Verdier, Jean-Michel; Jacubert, Serge; Grosbois, Jean; and Dumousseau, Jean-Yves, 4,617,098, Cl. 204-68.000.

Gross, Sol N., to AAA Steel and Enterprises Corp. Hydraulic shear head attachment for backhoe or the like. 4,616,417, Cl. 30-134.000.

Gross, William H.; and Naokawa, Toyojiro, to National Semiconductor Corporation. Matrix circuit for optical disc systems. 4,617,654, Cl. 369-46.000.

Grote, Michael G., to McDonnell Douglas Corporation. Wick-fin heat pipe. 4,616,699, Cl. 165-104.260.

Grover, Fred C.: *See*—
Farese, Virgil A.; Grover, Fred C.; Moore, Steve R.; and Gilfillan, Robert W., 4,616,395, Cl. 29-460.000.

Grzeczkowski, Thomas V.: *See*—
Albertini, Rocco D.; Clements, Ralph E.; and Grzeczkowski, Thomas V., 4,616,590, Cl. 114-230.000.

Gsell, Thomas C.: *See*—
Pall, David B.; Degen, Peter J.; and Gsell, Thomas C., 4,617,124, Cl. 210-638.000.

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Gala, Babulal V.; and McGough, Gerald B., 4,617,428, Cl. 179-100.00C.
Zrnich, Milan, 4,617,610, Cl. 361-415.000.

GTE Laboratories Incorporated: *See*—
Schlafer, John D., 4,616,899, Cl. 350-96.180.

GTE Products Corporation: *See*—
Hough, Harold L., 4,617,489, Cl. 313-13.000.
Rebentisch, Hugo E., 4,616,799, Cl. 248-289.300.

Gueussier, Andre , to Vallourec. Process for the production of semi-finished articles of hard steels using a continuous casting operation. 4,617,067, Cl. 148-2.000.

Gupta, Arunava; West, Gary A.; and Yardley, James T., to Allied Corporation. Production of conductive metal silicide films from ultrafine powders. 4,617,237, Cl. 428-446.000.

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Vea, Mathew P.; and Gupta, Vinita, 4,617,427, Cl. 179-84.0VF.

Gussoni, Damiano: *See*—
Costanzi, Silvestro; Traverso, Enrico; Podesta , Roberto; Gussoni, Damiano; and Busetto, Carlo, 4,617,333, Cl. 524-96.000.

Gutleber, Frank S. Interference cancelling receiver having high angular resolution intercept of transmitted radiators. 4,617,570, Cl. 342-429.000.

Gutmann, Robin P. E. Smoke or fire detector. 4,617,560, Cl. 340-628.000.

H. Stoll GmbH & Company: *See*—
Schmodde, Hermann, 4,616,488, Cl. 66-70.000.

Haag, Werner O.: *See*—
Bell, Weldon K.; Haag, Werner O.; Kirker, Garry W.; and Klocke, Donald J., 4,617,288, Cl. 502-331.000.

Haahjem, Kaare. Emptying device for bulk material. 4,616,969, Cl. 414-144.000.

Haas, Albert L., to Walbro Corporation. Fuel shut-off valve. 4,616,805, Cl. 251-297.000.

Haas, Peter; Barnes, James M.; and Goyert, Wilhelm, to Bayer Aktiengesellschaft. Bismorpholines and a process for their preparation. 4,617,387, Cl. 544-74.000.

Haas, Rudiger; Krauss, Ernst; and Walter, Herbert, to Mafell-Saschinenfabrik Rudolf Mey GmbH & Co. KG. Method and apparatus for machining a workpiece ultrasonically. 4,616,447, Cl. 51-59.0SS.

Habert, Guy; and Kraft, Harald, to Feldmuhle Aktiengesellschaft. Cutting tip for cutting-tools. 4,616,963, Cl. 407-114.000.

Hacking, Andrew J.: *See*—
Rathbone, Elner B.; Hacking, Andrew J.; and Cheetham, Peter S. J., 4,617,269, Cl. 435-97.000.

Hagedorn, Scott, to Celanese Corporation. 2-hydroxymuconic semialdehyde bisulfite adduct. 4,617,156, Cl. 260-513.00R.

Hagen, Helmut: *See—*
Dockner, Toni; Hagen, Helmut; and Krug, Herbert, 4,617,395, Cl. 546-178.000.

Hager, Walter, to Pfaff Industriemaschinen GmbH. Work clamp for buttonhole sewing machines. 4,616,582, Cl. 112-76.000.

Hagger, John M. R., to BICC Public Limited Company. Electric cables and compositions for use in them. 4,617,422, Cl. 174-23.00C.

Haggerty, Robert P.: *See—*
Vartoukian, Artin G.; and Haggerty, Robert P., 4,616,584, Cl. 112-121.150.

Haghiri-Tehrani, Yahya; and Hoppe, Joachim, to GAO Gesellschaft fur Automation und Organisation mbH. Multi-layer identification card. 4,617,216, Cl. 428-67.000.

Haghiri-Tehrani, Yahya: *See—*
Obrecht, Werner; Haghiri-Tehrani, Yahya; and Hoppe, Joachim, 4,617,605, Cl. 361-220.000.

Haisma, Jan; Heller, Petrus; Pasmans, Johannes M. M.; and Biermann, Udo K. P., to U.S. Philips Corporation. Method of manufacturing a layer of an oxide of an element from group IVa. 4,617,206, Cl. 427-374.100.

Hakulin, Bertel K.: *See—*
Engstrom, Folke; Hakulin, Bertel K.; and Ruottu, Seppo K., 4,616,576, Cl. 110-345.000.

Halden, Keith W. Mobile display system. 4,616,870, Cl. 296-21.000.

Halkey-Roberts Corporation: *See—*
Foltz, Carl L., 4,617,015, Cl. 604-100.000.

Hall, Lloyd E.: *See—*
Overcash, Donald A.; Hall, Lloyd E.; and Mueller, Guenter W., 4,616,504, Cl. 73-118.100.

Halliburton Company: *See—*
Dalrymple, Dwyann; and Vinson, Edward, 4,617,132, Cl. 252-8.554.
Yates, Donald N., Jr., 4,616,566, Cl. 102-318.000.

Hals, Finn A., to Gas Research Institute. Method for the heat processing of glass and glass forming material. 4,617,046, Cl. 65-134.000.

Hamada, Akira; Takahashi, Hisao; and Ohira, Keiichi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Electroconductive film and process for production thereof. 4,617,231, Cl. 428-297.000.

Hamada, Eiichi: *See—*
Watanabe, Hiroyuki; Hamada, Eiichi; Hayashi, Motomu; and Ono, Kenji, 4,616,445, Cl. 49-374.000.

Hamada, Hozumi, to Hitachi, Ltd. Operation unit for floating point data having a variable length exponent part. 4,617,641, Cl. 364-748.000.

Hamano, Tsutomu: *See—*
Nagasawa, Hideo; Suzuki, Masao; and Hamano, Tsutomu, 4,616,942, Cl. 400-196.100.

Hamberlin, Clifford W.: *See—*
Hanson, Merle E.; Titchener, Paul F.; and Hamberlin, Clifford W., 4,616,702, Cl. 166-65.100.

Hametner, Gerhard: *See—*
Reichl, Bernhard; Maurath, Rudolf; Koch, Dieter; and Hametner, Gerhard, 4,616,841, Cl. 280-432.000.

Hanafi, Nabil, to Uraca Pumpenfabrik GmbH & Co. KG. Piston or plunger pump. 4,616,983, Cl. 417-571.000.

Hanamoto, Yoshihiro: *See—*
Katagiri, Koichi; Hanamoto, Yoshihiro; Maeda, Satoru; and Taniguchi, Ikuo, 4,617,594, Cl. 358-150.000.

Hanaway, Roger D.; and Breyer, Randall E., to Deutz-Allis Corporation. Rock door latch with opposed roller detents. 4,616,661, Cl. 130-27.0JT.

Hanazono, Masanobu: *See—*
Fuyama, Moriaki; Tamura, Katsumi; Funyu, Isao; Nunokawa, Isao; Hanazono, Masanobu; and Hirastuka, Shigetoshi, 4,617,575, Cl. 346-76.0PH.

Haninger, Rudolf: *See—*
Rutschle, Eugen; Haninger, Rudolf; and Winkler, Hans-Henning, 4,616,398, Cl. 29-568.000.

Hanna, Marie R.: *See—*
Schreiber, William L.; Narula, Anubhav P. S.; and Hanna, Marie R., 4,617,145, Cl. 252-522.00R.

Hannart, Jean A. A. J., to Omnichem, S.A. 4-alkylindolonaphthyridines and their therapeutical application. 4,617,305, Cl. 514-278.000.

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Ueberschar, Reinhard, 4,616,525, Cl. 74-606.00R.

Hanson, Brian A.: *See—*
Cunningham, Alton J.; and Hanson, Brian A., 4,617,617, Cl. 362-267.000.

Hanson, Merle E.; Titchener, Paul F.; and Hamberlin, Clifford W., to Comdisco Resources, Inc. Tool and combined tool support and casing section for use in transmitting data up a well. 4,616,702, Cl. 166-65.100.

Hanssen, Tore B.; and Kahale, Abed G., to Controls Company of America. Adjustable pressure responsive switch assembly. 4,617,432, Cl. 200-81.00R.

Hanzawa, Shigeru: *See—*
Ogawa, Yutaka; Ogasawara, Takayuki; and Hanzawa, Shigeru, 4,616,611, Cl. 123-270.000.

Harada, Yoshihito: *See—*
Suzuki, Masayuki; Fukahori, Hidehiko; Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; and Ohara, Tsunemasa, 4,616,913, Cl. 354-173.100.

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Harding, Curtis F.: *See—*
Simmons, Harold C.; and Harding, Curtis F., 4,616,784, Cl. 239-404.000.

Hards, John E., to Brunette Machine Works, Ltd. Flying bucksaw apparatus. 4,616,542, Cl. 83-155.000.

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Douglas, Jack E., 4,616,864, Cl. 292-336.300.

Harman, Douglas G.; Veronesi, Luciano; and Wowczuk, Andrew, to Westinghouse Electric Corp. Rotopeening method. 4,616,497, Cl. 72-53.000.

Harnack, Phyllis M.: *See—*
Fitzpatrick, Brian J.; and Harnack, Phyllis M., 4,617,490, Cl. 313-478.000.

Harper, Daniel R.: *See—*
Edwards, John W.; Harper, Daniel R.; and McNew, Quinton B., 4,616,883, Cl. 305-40.000.

Harris, Christopher F.: *See—*
Suchdeo, Shyam R.; Patel, Suresh U.; and Harris, Christopher F., 4,617,036, Cl. 62-11.000.

Harris, Clarence E., Jr., to United States of America, Agriculture. Ova harvesting system. 4,616,381, Cl. 17-45.000.

Harris Corporation: *See—*
Webster, Mark A.; and Roberts, Richard D., 4,617,553, Cl. 340-347.0DD.

Harris, Robert L.: *See—*
Scott, Charles G.; and Harris, Robert L., 4,617,431, Cl. 179-156.00A.

Harrison, James E.; and Presnell, John B., to St. Joe Forest Products Company. Apparatus and process for boiler ash collection. 4,616,935, Cl. 366-165.000.

Harrold, Michael C.: *See—*
Ray, Martin G.; and Harrold, Michael C., 4,617,028, Cl. 55-1.000.

Hartmann, Robert F.; Wong, Sau-Ching; Chan, Yiu-Fai; and Ou, Jung-Hsing, to Altera Corporation. Programmable logic array device using EPROM technology. 4,617,479, Cl. 307-465.000.

Hartmann, Werner; Hoffmann, Gottfried; and Reuland, Joachim, to Hauni-Werke Korber & Co. KG. Method and apparatus for producing a rod-shaped filler from several types of smokable material. 4,616,662, Cl. 131-84.100.

Hartness, Robert G. Apparatus for aligning and feeding articles upright on an article loading machine. 4,616,745, Cl. 198-442.000.

Haruyama, Hideaki: *See—*
Kobayashi, Hiroshi; Hirose, Tsuguhiro; and Haruyama, Hideaki, 4,617,656, Cl. 370-74.000.

Harvey, Marvin R. Fishing apparatus and indicating device. 4,616,437, Cl. 43-17.000.

Harvey, Vernon B. W. Irrigation or other machine having a rotatable drum carrying a hose or other flexible element wound thereon. 4,616,791, Cl. 242-86.200.

Harwood-Nash, Derek C.; Fitz, Charles R.; Zouch, Edward T.; and Smith, John M., to Hospital for Sick Children, The. X-ray head holder. 4,616,814, Cl. 269-328.000.

Hasegawa, Kenji: *See—*
Satoh, Toshio; Miyataka, Hideki; Masamoto, Yukimitsu; Asai, Takashi; Hasegawa, Kenji; and Kakegawa, Hisao, 4,617,292, Cl. 514-27.000.

Hassler, John M., Jr., to United States of America, National Aeronautics and Space Administration. Remote pivot decoupler pylon: wing/store flutter suppressor. 4,616,793, Cl. 244-137.00A.

Hatakeyama, Yasuhiko: *See—*
Nagashima, Shigeo; Abe, Hitoshi; and Hatakeyama, Yasuhiko, 4,617,625, Cl. 364-200.000.

Hatanaka, Akiko: *See—*
Ikeya, Hirotoshi; and Hatanaka, Akiko, 4,617,584, Cl. 357-72.000.

Hatanaka, Masayoshi; and Takeuchi, Daizo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for the preparation of adenosine-5'-triphosphate by fermentation. 4,617,268, Cl. 435-92.000.

Hattori, Tadashi: *See—*
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Hattori, Toshihiko; Akagi, Yuji; and Kohara, Hideo, to Mazda Motor Corporation. Vane type compressor having an improved rotatable sleeve. 4,616,985, Cl. 418-173.000.

Haubs, Michael K.: *See—*
Taylor, Lloyd D.; and Haubs, Michael K., 4,617,253, Cl. 430-323.000.

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Hartmann, Werner; Hoffmann, Gottfried; and Reuland, Joachim, 4,616,662, Cl. 131-84.100.
Lorenzen, Heinz-Christen; Heitmann, Uwe; and Steiniger, Wolfgang, 4,616,663, Cl. 131-109.300.

Hausberg, Hans-Heinrich: *See—*
Bottcher, Henning; Gottschlich, Rudolf; Hausberg, Hans-Heinrich; Seyfried, Christoph; and Minck, Klaus-Otto, 4,617,309, Cl. 514-339.000.

Haushalter, Robert C., to United States of America, Energy. Chemical synthesis of thin films and supported crystals by oxidation of zintl anions. 4,617,204, Cl. 427-304.000.

Havemann, Robert K., to Thermo King Corporation. Centrifugal clutch particularly useful in transport refrigeration unit. 4,616,743, Cl. 192-105.0BA.

Hawkins, Phillip J., to Westinghouse Electric Corp. Rotopeening apparatus having a flexible spindle. 4,616,496, Cl. 72-53.000.

Haworth, Inc.: *See*—
Smeenge, Paul A.; Wilson, Harold R.; and Nelsen, Randy P., 4,616,798, Cl. 248-281.100.
Hayakawa, Kazumasa: *See*—
Makio, Tatsumi; Hayakawa, Kazumasa; and Sakaguchi, Genta, 4,616,819, Cl. 271-122.000.
Hayano, Kiyoharu: *See*—
Tahara, Tetsuya; Hayano, Kiyoharu; Setoguchi, Michihide; and Fukuda, Takemi, 4,617,314, Cl. 514-422.000.
Hayashi, Motomu: *See*—
Watanabe, Hiroyuki; Hamada, Eiichi; Hayashi, Motomu; and Ono, Kenji, 4,616,445, Cl. 49-374.000.
Hayashi, Yoshimasa, to Nissan Motor Co., Ltd. Radiator anti-freeze arrangement for evaporative type cooling system. 4,616,601, Cl. 123-41.210.
Hayes-Albion Corporation: *See*—
Moore, Alan R.; and Januszewski, Nicholas M., 4,616,580, Cl. 111-7.000.
Haygood, Lawton C., to Lawton Haygood Corporation. Forced draft stove. 4,616,627, Cl. 126-77.000.
Haythornthwaite, James. Tennis ball. 4,616,828, Cl. 273-61.00R.
Hayward Pool Products, Inc.: *See*—
Messinger, Robert; and Tobias, Samuel J., 4,617,117, Cl. 210-198.100.
Heath, Rodney T. Methods and apparatus for separating gases and liquids from natural gas wellhead effluent. 4,617,030, Cl. 55-20.000.
Heckel, Dennis C.: *See*—
White, George E.; and Heckel, Dennis C., 4,616,522, Cl. 74-492.000.
Heckel, Thomas A., Jr.; and Rizzo, Felice J., to Du Pont de Nemours, E. I., and Company. Melt extrudable composition of perfluorocarbon polymers. 4,617,351, Cl. 525-199.000.
Hederich, Manfred: *See*—
Ullrich, Martin; Hederich, Manfred; and Wingler, Frank, 4,617,089, Cl. 159-43.100.
Hedrick, Ross M.: *See*—
Gabbert, James D.; and Hedrick, Ross M., 4,617,355, Cl. 525-420.000.
Heideman, Robert C., to AMCO Manufacturing Corporation. Modular luggage rack with accessories. 4,616,771, Cl. 224-321.000.
Heil-Quaker Corporation: *See*—
Tomlinson, Ronald S., 4,616,994, Cl. 431-347.000.
Heimburger, Stanley A.: *See*—
Krivak, Thomas G.; Heimburger, Stanley A.; and Dew, James T., 4,617,294, Cl. 514-52.000.
Heine, Heinrich: *See*—
Kohler, Peter; Ringe, Peter; and Heine, Heinrich, 4,617,061, Cl. 106-302.000.
Heinemann, Fritz, to ZF-Herion Systemtechnik GmbH. Strain-wave transmission with tubular strain wheel. 4,616,529, Cl. 74-640.000.
Heinrich, Peter: *See*—
Knop, Klaus; and Heinrich, Peter, 4,617,051, Cl. 75-91.000.
Heinzl, Burno; Frowein, Herbert; Stiegler, Hartmut; Wurz, Joachim; Schmidt, Horst; Huttel, Willi; and Schmitz, Karl-Heinz, to Buderus Aktiengesellschaft. Manufacture of tray holder from single molded article. 4,616,754, Cl. 211-71.000.
Heitmann, Uwe: *See*—
Lorenzen, Heinz-Christen; Heitmann, Uwe; and Steiniger, Wolfgang, 4,616,663, Cl. 131-109.300.
Helber, Carlyle L., Jr.; and Ludwig, Frank A., to Hughes Aircraft Company. Electroless plating apparatus. 4,616,596, Cl. 118-603.000.
Held, Michael J.: *See*—
Anderson, Russell W.; and Held, Michael J., 4,616,965, Cl. 408-204.000.
Heller, Petrus: *See*—
Haisma, Jan; Heller, Petrus; Pasmans, Johannes M. M.; and Biermann, Udo K. P., 4,617,206, Cl. 427-374.100.
Helmic, Inc.: *See*—
Jaskowski, Michael C., 4,617,383, Cl. 536-2.000.
Helmlinger, Daniel; Pesaro, Mario; and Klaus, Michael, to Givaudan Corporation. Substituted bicyclo[4.3.0]non-1(6)-en-8-yl methyl ketones and fragrance and flavor compositions. 4,617,146, Cl. 252-522.00R.
Hemphill, Dean P., to Shell Oil Company. Pipeline launching module. 4,616,956, Cl. 405-158.000.
Hendrie, Susan D.: *See*—
Eisenhaure, David B.; Downer, James R.; Bliamptis, Tim E.; Oberbeck, George A.; and Hendrie, Susan D., 4,617,507, Cl. 322-4.000.
Henkel Corporation: *See*—
Willging, Stephen M., 4,617,406, Cl. 549-413.000.
Her Majesty the Queen in right of the Province of Alberta as represented by the Minister of Energy and Natural Resources: *See*—
Bach, Lars; and Stark, Eduard, 4,616,991, Cl. 425-396.000.
Herbertz, Klaus: *See*—
Bober, Helmut; Buthe, Theo; Coenen, Karl; Fartmann, Norbert; Herbertz, Klaus; Koch, Heinz; Kretschmer, Horst; Nienhaus, Clemens; Schardt, Peter; Schibrowski, Jurgen; and Schmandt, Willi, 4,617,003, Cl. 464-48.000.
Hercules Incorporated: *See*—
Berta, Dominic A., 4,616,686, Cl. 152-510.000.
Berta, Dominic A., 4,616,687, Cl. 152-510.000.
Shields, Susan J., 4,617,148, Cl. 252-547.000.
Hessbruggen, Norbert, to UMA Corporation. Chuck assembly. 4,616,538, Cl. 82-40.00R.
Hewison, George D., to ITW Limited. Fastening assembly. 4,616,455, Cl. 52-127.120.
Hewlett-Packard Company: *See*—
Lloyd, William J., 4,616,408, Cl. 29-611.000.
Narimatsu, Yoh; and Niizaki, Minoru, 4,617,604, Cl. 361-160.000.
Tullis, Barclay J.; Parikh, Mihir; Thrasher, David L.; and Johnston, Mark E., 4,616,683, Cl. 141-98.000.
Hicks, John W., Jr., to Polaroid Corporation. Optical communication systems using raman repeaters and components therefor. 4,616,898, Cl. 350-96.150.
Hiejima, Kiyoshi: *See*—
Koide, Satoshi; and Hiejima, Kiyoshi, 4,617,441, Cl. 219-10.770.
Higashi, Hiromi: *See*—
Kinoshita, Akihiro; Namariyama, Yohichi; and Higashi, Hiromi, 4,617,254, Cl. 430-326.000.
Higgins, William: *See*—
Plungis, Donald W.; Seymour, Charles S.; and Higgins, William, 4,616,503, Cl. 73-55.000.
Higuchi, Masahiro: *See*—
Miyauchi, Masahiro; and Higuchi, Masahiro, 4,617,582, Cl. 346-208.000.
Hikawa, Kazuo; Toyomaki, Kazuya; and Yamazaki, Hiroyuki, to Victor Company of Japan, Ltd. Sync responsive clock generator for digital demodulators. 4,617,526, Cl. 331-1.00A.
Hiki, Toshio: *See*—
Matsumoto, Yoshikane; and Hiki, Toshio, 4,616,943, Cl. 400-247.000.
Hikino, Tadashi; and Turuda, Kunihiro, to Matsushita Electric Industrial Co., Ltd. Liquid fuel combustion apparatus. 4,616,993, Cl. 431-41.000.
Hilbert, Samuel D.: *See*—
Pruett, Wayne P.; Wang, Richard H. S.; Hilbert, Samuel D.; and Weaver, Max A., 4,617,373, Cl. 528-288.000.
Pruett, Wayne P.; Wang, Richard H. S.; Hilbert, Samuel D.; and Weaver, Max A., 4,617,374, Cl. 528-288.000.
Hilfiker Pipe Co.: *See*—
Hilfiker, William K., 4,616,959, Cl. 405-286.000.
Hilfiker, William K., to Hilfiker Pipe Co. Seawall using earth reinforcing mats. 4,616,959, Cl. 405-286.000.
Hill, Howard L.; and Gillum, Gary L., to Goodyear Tire & Rubber Company, The. Light weight tire mold for two piece tread ring. 4,616,986, Cl. 425-32.000.
Himmele, Walter: *See*—
Jahn, Dieter; Becker, Rainer; Keil, Michael; Himmele, Walter; and Wuerzer, Bruno, 4,617,050, Cl. 71-98.000.
Himmelstein, Sydney; Tveter, Richard S.; and Beck, James P., to S. Himmelstein and Company. Torquemeter. 4,616,512, Cl. 73-862.360.
Hinojos, Antonio R.; and Bone, Bertram T., Jr., to Phillips Petroleum Company. Control of a hydrofining process for hydrocarbon-containing feed streams which process employs a hydrodemetallization reactor in series with a hydrodesulfurization reactor. 4,617,110, Cl. 208-211.000.
Hinson, James W.; and Cleverdon, Jo A., to Ciba-Geigy Corporation. Process for the preparation of concentrated stable liquid dye solutions of CI Direct Yellow 11 utilizing an extended surface silica filter aid during a desalting procedure. 4,617,380, Cl. 534-576.000.
Hinson, James W.; and Cleverdon, Jo A., to Ciba-Geigy Corporation. Process for the preparation of concentrated stable liquid dye solutions of CI Direct Yellow 11 utilizing an alkanol/water solvent in a desalting procedure. 4,617,381, Cl. 534-576.000.
Hirai, Koichi: *See*—
Watanabe, Katsushi; Kageyama, Takafumi; Kano, Taisaku; Hirai, Koichi; and Ichihara, Yoshinobu, 4,617,367, Cl. 526-273.000.
Hirai, Tadaaki: *See*—
Tanioka, Kenkichi; Shidara, Keiichi; Kuriyama, Takao; Takasaki, Yukio; Hirai, Tadaaki; Nonaka, Yasuhiko; and Inoue, Eisuke, 4,617,248, Cl. 430-95.000.
Hiramatsu, Teruaki, to Nippon Zeon Co. Ltd. Process for controlling a distillation column. 4,617,092, Cl. 203-1.000.
Hiramoto, Nobuo: *See*—
Taguchi, Takafumi; Nakano, Masahiro; Hiramoto, Nobuo; and Tominaga, Hideki, 4,616,599, Cl. 123-41.100.
Hirano, Hiroyuki: *See*—
Tanaka, Yoshikazu; Kumura, Haruyoshi; Abo, Keiju; Yamamuro, Sigeaki; and Hirano, Hiroyuki, 4,616,530, Cl. 74-851.000.
Hirano, Yoshinori, to Nissan Motor Co., Ltd. Cylinder block for internal combustion engine. 4,616,600, Cl. 123-41.210.
Hirano, Yoshinori; and Kubozuka, Takao, to Nissan Motor Co., Ltd. Cooling system for automotive engine or the like. 4,616,602, Cl. 123-41.270.
Hirastuka, Shigetoshi: *See*—
Fuyama, Moriaki; Tamura, Katsumi; Funyu, Isao; Nunokawa, Isao; Hanazono, Masanobu; and Hirastuka, Shigetoshi, 4,617,575, Cl. 346-76.0PH.
Hirochika, Takashi: *See*—
Kanai, Seita; and Hirochika, Takashi, 4,616,847, Cl. 280-707.000.
Hirose, Minoru: *See*—
Yamauchi, Masahide; and Hirose, Minoru, 4,616,817, Cl. 271-9.000.
Hirose, Tsuguhiro: *See*—
Kobayashi, Hiroshi; Hirose, Tsuguhiro; and Haruyama, Hideaki, 4,617,656, Cl. 370-74.000.
Hiroshima, Minoru; Matsumoto, Shinzo; Sekino, Mitsuru; and Taniguchi, Yoshinori, to Hitachi, Ltd. High-density magnetic bubble memory device. 4,617,644, Cl. 365-36.000.

Hisajima, Masahiko: *See*—
Kimura, Hiroshi; Hisajima, Masahiko; Shibata, Kiyoshi; and Morimoto, Kiyoshi, 4,616,924, Cl. 355-15.000.
Hisamura, Masafumi: *See*—
Tanaka, Shigemori; Sumino, Fumio; Kubo, Keiji; Hisamura, Masafumi; Toma, Hitoshi; and Fujimura, Naoto, 4,617,245, Cl. 430-58.000.
Hiscock, Donald F.; Jacomet, Joe A.; and Carter, Deborah H., to Mead Corporation, The. Reinforced paperboard cartons and method for making same. 4,617,223, Cl. 428-211.000.
Hitachi Koki Company, Limited: *See*—
Matsumoto, Yoshikane; and Hiki, Toshio, 4,616,943, Cl. 400-247.000.
Hitachi, Ltd.: *See*—
Fuyama, Moriaki; Tamura, Katsumi; Funyu, Isao; Nunokawa, Isao; Hanazono, Masanobu; and Hirastuka, Shigetoshi, 4,617,575, Cl. 346-76.0PH.
Hamada, Hozumi, 4,617,641, Cl. 364-748.000.
Hiroshima, Minoru; Matsumoto, Shinzo; Sekino, Mitsuru; and Taniguchi, Yoshinori, 4,617,644, Cl. 365-36.000.
Inoue, Fumio; Eto, Masahiro; and Kubota, Takashi, 4,617,591, Cl. 358-67.000.
Kuboki, Shigeo; Maejima, Hideo; and Masuda, Ikuro, 4,617,648, Cl. 365-189.000.
Kuroiwa, Hiroshi; and Oyama, Yoshishige, 4,616,621, Cl. 123-585.000.
Nagashima, Shigeo; Abe, Hitoshi; and Hatakeyama, Yasuhiko, 4,617,625, Cl. 364-200.000.
Nakata, Yukio; Suda, Kaoru; Shiotsu, Osamu; and Morito, Motoyoshi, 4,617,565, Cl. 340-825.500.
Noguchi, Takaharu; Kobayashi, Masaharu; Arai, Takao; and Shibuya, Toshifumi, 4,617,599, Cl. 360-32.000.
Sakaue, Shiyuki; Sugimoto, Koichi; and Arai, Shinichi, 4,617,502, Cl. 318-568.000.
Tanioka, Kenkichi; Shidara, Keiichi; Kuriyama, Takao; Takasaki, Yukio; Hirai, Tadaaki; Nonaka, Yasuhiko; and Inoue, Eisuke, 4,617,248, Cl. 430-95.000.
Yasunobu, Seiji; Miyamoto, Shoji; and Ihara, Hirokazu, 4,617,627, Cl. 364-426.000.
Yasuoka, Hideki, 4,616,405, Cl. 29-578.000.
Hitachi Metals, Ltd.: *See*—
Arakawa, Shunsuke; and Suzuki, Hiroya, 4,616,424, Cl. 33-361.000.
Hitachi Zosen Corporation: *See*—
Yasuda, Kenji, 4,616,692, Cl. 165-1.000.
Hjerten, Wilhelm E. S.: *See*—
Bjornberg, Sten G.; Hjerten, Wilhelm E. S.; and Wadstrom, Torkel M., 4,617,326, Cl. 523-111.000.
Ho, Peter P. K., to Eli Lilly and Company. Antiasthmatic method. 4,617,311, Cl. 514-353.000.
Ho, Roland K.: *See*—
Shak, Peter J.; and Ho, Roland K., 4,617,606, Cl. 361-283.000.
Hobson, Willis S., to Seymour Manufacturing Company. Three axis corner bracket. 4,616,757, Cl. 211-189.000.
Hocker, Jurgen: *See*—
Kossmehl, Gerhard; and Hocker, Jurgen, 4,617,143, Cl. 252-500.000.
Hodges, Paul L.; and Duerr, David R., to Data Conversion Inc. Apparatus to place microfilm frames in jackets. 4,616,473, Cl. 53-520.000.
Hoechst Aktiengesellschaft: *See*—
Reuter, Klaus, 4,616,923, Cl. 355-14.00E.
Rittner, Siegbert; Morach, Eugen; Schindler, Hubert; and John, Peter, 4,617,197, Cl. 427-180.000.
Spietschka, Ernst; and Urban, Manfred, 4,617,403, Cl. 549-56.000.
Hoffgen, Hans. Gas bubble brick for metallurgical vessels. 4,616,809, Cl. 266-220.000.
Hoffmann, Gottfried: *See*—
Hartmann, Werner; Hoffmann, Gottfried; and Reuland, Joachim, 4,616,662, Cl. 131-84.100.
Hoffmann-La Roche Inc.: *See*—
Boris, Alfred; Partridge, John J.; and Uskokovic, Milan R., 4,617,297, Cl. 514-167.000.
Hubschwerlen, Christian N.; and Schmid, Gerard, 4,617,150, Cl. 540-364.000.
Hoganas AB: *See*—
Ivarsson, Paul L.; Blom, Ingvar G. A.; and Berg, Lars G., 4,617,280, Cl. 501-84.000.
Hokuto MFG, Co., Ltd.: *See*—
Hoshi, Mitsuo, 4,616,678, Cl. 137-888.000.
Holley, Kenneth: *See*—
Marietta, Charles F.; and Holley, Kenneth, 4,616,782, Cl. 239-752.000.
Holt, Roy J., to United States of America, Energy. Polarized internal target apparatus. 4,617,462, Cl. 250-251.000.
Holtz, Gilbert J. Readily assembled two-shelf cart. 4,616,756, Cl. 211-181.000.
Holzmann, Rainer: *See*—
Giese, Peter; Holzmann, Rainer; Schwochert, Hans-Joachim; and Thomas, Alfred, 4,617,077, Cl. 156-245.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Furuya, Kunitaka; Inagaki, Hiromi; Koga, Kiyoshi; Yorita, Masaru; Fukatsu, Tsunehiko; and Matsuura, Kazuo, 4,616,846, Cl. 280-673.000.
Ishida, Atsushi, 4,616,610, Cl. 123-196.00A.
Matsumoto, Yoshiyuki; and Maru, Hideki, 4,616,849, Cl. 280-724.000.
Shiga, Mitsuo, 4,616,608, Cl. 123-192.00B.
Suzuki, Toshifumi; Kawano, Toshio; Setoguchi, Ryoichi; Ishida, Toshio; and Mikami, Seiiti, 4,616,411, Cl. 29-822.000.
Hoover Universal, Inc.: *See*—
Irwin, Christopher; and Bowen, Richard M., 4,617,166, Cl. 264-531.000.
Hoppe, Joachim: *See*—
Haghiri-Tehrani, Yahya; and Hoppe, Joachim, 4,617,216, Cl. 428-67.000.
Obrecht, Werner; Haghiri-Tehrani, Yahya; and Hoppe, Joachim, 4,617,605, Cl. 361-220.000.
Hoppe, Udo; Seib, Karl; Naegele, Paul; and Martin, Roland, to BASF Aktiengesellschaft. S-triazine derivatives. 4,617,390, Cl. 544-197.000.
Horikawa, Kazuo, to Fuji Photo Film Co., Ltd. Method and apparatus for detecting the leading edge of a sheet to be scanned. 4,617,470, Cl. 250-561.000.
Horikawa, Youichi, to Yoshida Kogyo K. K. Method of cutting slide fastener chain. 4,616,539, Cl. 83-42.000.
Horiuchi, Hideyuki: *See*—
Nakamura, Keiichi; and Horiuchi, Hideyuki, 4,617,425, Cl. 179-6.110.
Horn, Peter; Baumann, Edwin; Marx, Matthias; and Gerarts, Peter, to BASF Aktiengesellschaft. Sheet-like reinforced material. 4,617,225, Cl. 428-215.000.
Horner, Joseph L. Capacitance measuring device including an over-range circuit. 4,617,512, Cl. 324-60.0CD.
Hornung, Klaus; Alt, Anton; Schulte, Gunter; and Mahnig, Fritz, to Georg Fischer Aktiengesellschaft. Method for improving the immunity to temperature changes of cast iron containing lamellar graphite. 4,617,069, Cl. 148-138.000.
Horodysky, Andrew G.; and Ashjian, Henry, to Mobil Oil Corporation. Friction reducing, antiwear additives. 4,617,133, Cl. 252-32.500.
Horvath, Vincent V.: *See*—
Krause, Richard H.; Pfeiffer, Thomas J.; and Horvath, Vincent V., 4,617,638, Cl. 364-557.000.
Hosaka, Tomiharu; Kishimoto, Yoshio; and Shimotsuma, Wataru, to Matsushita Electric Industrial Co., Ltd. Temperature sensitive polymer compositions. 4,617,356, Cl. 525-429.000.
Hoshi, Katsuji, to NEC Corporation. Memory circuit. 4,617,647, Cl. 365-189.000.
Hoshi, Mitsuo, to Hokuto MFG, Co., Ltd. Means for preventing water hammer in fluid-feeding system. 4,616,678, Cl. 137-888.000.
Hoshikawa, Kyofu; Ishiwatari, Seishiro; and Tanahashi, Mitsuru, to Bridgestone Corporation; and Shinmei Rubber Ind., Co., Ltd. Pressure-sensitive conductive strip switch assembly and a method of manufacturing the same. 4,617,433, Cl. 200-86.00R.
Hospal Industrie: *See*—
Vantard, Georges, 4,617,115, Cl. 210-90.000.
Hospital for Sick Children, The: *See*—
Harwood-Nash, Derek C.; Fitz, Charles R.; Zouch, Edward T.; and Smith, John M., 4,616,814, Cl. 269-328.000.
Hotset Heizpatronen und Zubehor GmbH: *See*—
Schwarzkopf, Eugen, 4,617,455, Cl. 219-523.000.
Hotta, Toshiaki: *See*—
Nakamura, Shigenobu; Nimura, Takayasu; and Hotta, Toshiaki, 4,617,485, Cl. 310-65.000.
Hotta, Yuji; Abe, Takao; Ishii, Fumio; Kitamura, Shigehiro; Koshizuka, Kunihiro; and Nakamura, Masaki, to Konishiroku Photo Industry Co., Ltd. Thermal transfer recording medium. 4,617,224, Cl. 428-212.000.
Hough, Harold L., to GTE Products Corporation. Compact fluorescent lamp having internal thermally actuable means. 4,617,489, Cl. 313-13.000.
Houle, Frances A.: *See*—
Chuang, Tung J.; Houle, Frances A.; and Petersen, Kurt E., 4,617,086, Cl. 156-643.000.
Hoving, Klaas: *See*—
van der Vleugel, Dominicus J. M.; Hoving, Klaas; Wortel, Theodorus M.; Rosensweig, Ronald E.; and Rees, Lovat V. C., 4,617,282, Cl. 502-66.000.
Howard, H. Keith; Sherrill, Jimmy L.; and Kirby, Robert L., to Tutco, Inc. Heater assembly. 4,617,547, Cl. 338-317.000.
Hsieh, Shih-yung. Fireproof cabinet system for electronic equipment. 4,616,694, Cl. 165-47.000.
Hsu, Dick Y. Wiring construction of a control switch controlling a ceiling fan. 4,617,500, Cl. 318-305.000.
Huang, Pen-Ho: *See*—
Chuang, Chiu-Hsiung, 4,617,541, Cl. 335-133.000.
Hubbard, Vance M.; and Brunson, Welton K., to Tencol, Inc. Personal catheter leg strap. 4,617,017, Cl. 604-179.000.
Huber, Rudolph A.: *See*—
Mancini, George M.; and Huber, Rudolph A., 4,616,547, Cl. 84-1.030.
Huber, William C. Orthopedic belt with leg supports. 4,616,639, Cl. 128-99.000.
Hubschwerlen, Christian N.; and Schmid, Gerard, to Hoffmann-La Roche Inc. β-lactams. 4,617,150, Cl. 540-364.000.
Hucks, Uwe: *See*—
Freitag, Dieter; Bottenbruch, Ludwig; and Hucks, Uwe, 4,617,368, Cl. 528-126.000.
Hucul, Daniel E.: *See*—
Matheson, Ronald R.; and Hucul, Daniel E., 4,616,978, Cl. 417-2.000.
Hudgens, Rick D.: *See*—
Macksey, Harry M.; and Hudgens, Rick D., 4,616,400, Cl. 29-571.000.

Huemer, Franz X. Arrangement for the supervision of weft threads on a circular loom. 4,616,681, Cl. 139-371.000.
Huffaker, Roger W.; and Stanton, Paul N., to Exxon Production Research Co. Apparatus for performing subsea through-the-flowline operations. 4,616,706, Cl. 166-341.000.
Hughes Aircraft Company: *See—*
Helber, Carlyle L., Jr.; and Ludwig, Frank A., 4,616,596, Cl. 118-603.000.
Jergenson, Jerg B., 4,617,203, Cl. 427-294.000.
Vasudev, Prahalad K., 4,617,066, Cl. 148-1.500.
Hughes Tool Company: *See—*
Gambertoglio, Louis M., 4,616,718, Cl. 175-4.540.
Woodman, Daniel C.; and Neely, Stephen A., 4,616,857, Cl. 285-140.000.
Hugo, Albert. Television dish antenna mounting structure. 4,617,572, Cl. 343-765.000.
Hunter Douglas International N.V.: *See—*
Rocholl, Johan P.; and De Jong, Hendrikus, 4,617,339, Cl. 524-514.000.
Huttel, Willi: *See—*
Heinzl, Burno; Frowein, Herbert; Stiegler, Hartmut; Wurz, Joachim; Schmidt, Horst; Huttel, Willi; and Schmitz, Karl-Heinz, 4,616,754, Cl. 211-71.000.
Huynh-Ba, Gia, to Du Pont de Nemours, E. I., and Company. Polyester polymers of 3-hydroxy-4'-(4-hydroxyphenyl)benzophenone or 3,4'-dihydroxybenzophenone and dicarboxylic acids. 4,617,369, Cl. 528-128.000.
Hwang, Sun-Tak, to University of Cincinnati. Method and apparatus for separating components of a mixture. 4,617,093, Cl. 203-100.000.
Hydril Company: *See—*
Wood, John R.; Siska, Margaret M.; and Raymond, Patrick A., 4,616,700, Cl. 166-250.000.
Hynes, Maurice A.; and Freeman, Roger L., to Atlantic Hydrodynamics, Inc. Mobile pump system. 4,616,979, Cl. 417-231.000.
Ichihara, Yoshinobu: *See—*
Watanabe, Katsushi; Kageyama, Takafumi; Kano, Taisaku; Hirai, Koichi; and Ichihara, Yoshinobu, 4,617,367, Cl. 526-273.000.
Ichinomiya, Yoshiaki: *See—*
Takenouchi, Tomoo; Ichinomiya, Yoshiaki; and Iwanami, Yoshiyuki, 4,617,052, Cl. 420-117.000.
Ihara, Hirokazu: *See—*
Yasunobu, Seiji; Miyamoto, Shoji; and Ihara, Hirokazu, 4,617,627, Cl. 364-426.000.
Iida, Norikazu: *See—*
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Ikeda, Takasi: *See—*
Shinonome, Osami; Ikeda, Takasi; Kanmuri, Yoshihiro; and Matuoka, Fumio, 4,617,235, Cl. 428-374.000.
Ikeda, Yasuo: *See—*
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Millet, Jean-Claude; and Reynaud, Jean-Louis, 4,617,574, Cl. 346-75.000.
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Lutz, Erno B.; Weber, Bruce A.; and Markle, Jerry, 4,617,542, Cl. 335-196.000.
Imperial Chemical Industries PLC: *See—*
Smith, Peter J., 4,617,163, Cl. 264-235.600.
Inagaki, Hiromi: *See—*
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Industrial Innovations, Inc.: *See—*
Urbani, William G., 4,616,377, Cl. 15-302.000.
Industrial Sheet Metal & Mechanical Corporation: *See—*
Fisher, Gary H.; and Padgett, H. Pat, 4,616,777, Cl. 236-44.00C.
Ing Ludwig Pietzsch GmbH & Co.: *See—*
Pietzsch, Ludwig; Overlach, Knud; and Gassner, Siegfried, 4,616,723, Cl. 177-211.000.
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Forsen, Ivan, 4,616,421, Cl. 33-233.000.
Inoue, Eisuke: *See—*
Tanioka, Kenkichi; Shidara, Keiichi; Kuriyama, Takao; Takasaki, Yukio; Hirai, Tadaaki; Nonaka, Yasuhiko; and Inoue, Eisuke, 4,617,248, Cl. 430-95.000.
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Laurent, Jean; and Fabre, Andre , 4,616,703, Cl. 166-66.400.
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Nikolov, Ivan D., deceased; Dimova, Vassilka P., heir; Dimov, Dobromir I., heir; Dimov, Petar I., heir; Marinov, Marin I.; Peytchev, Ivan M.; Rashev, Tzolo V.; and Tchorbov, Iliya G., 4,616,808, Cl. 266-207.000.
International Business Machines Corporation: *See—*
Adley, James M.; and Chang, Phillip, 4,616,919, Cl. 355-3.0DD.
Aichelmann, Frederick J., Jr.; and Lange, Lawrence K., 4,617,664, Cl. 371-38.000.
Chuang, Tung J.; Houle, Frances A.; and Petersen, Kurt E., 4,617,086, Cl. 156-643.000.
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Iyer, Subramanian S.; and Joshi, Rajiv V., 4,617,087, Cl. 156-643.000.
Komplin, Steven R., 4,616,945, Cl. 400-697.100.
Sachdev, Krishna G.; Afzali-Ardakani, Ali; Pennington, Keith S.; and Cohen, Mitchell S., 4,617,579, Cl. 346-135.100.
Yang, Kei-Hsiung, 4,617,646, Cl. 365-108.000.
Yoshioka, Yoshikazu, 4,617,564, Cl. 340-798.000.
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Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,617,144, Cl. 252-522.00A.
Schreiber, William L.; Narula, Anubhav P. S.; and Hanna, Marie R., 4,617,145, Cl. 252-522.00R.
Wiener, Charles; and Pittet, Alan O., 4,617,419, Cl. 568-464.000.
International Paper Company: *See—*
Fries, Carl J., Jr., 4,617,211, Cl. 428-35.000.
International Totalizator Systems, Inc.: *See—*
Moeller, Charles R., 4,617,576, Cl. 346-76.0PH.
Intersil, Inc.: *See—*
Bingham, David, 4,617,473, Cl. 307-66.000.
Intertechnique: *See—*
Beaussant, Raymond, 4,616,646, Cl. 128-205.240.
Inukai, Tadahiko: *See—*
Yamada, Hideaki; Otsuji, Shogo; Isobe, Kimiyasu; Matsunaga, Kuniyoshi; and Inukai, Tadahiko, 4,617,263, Cl. 435-25.000.
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Ionics, Incorporated: *See—*
MacDonald, Russell J., 4,617,321, Cl. 521-38.000.
Iorio, David V.: *See—*
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Burns, Stanley G., 4,616,425, Cl. 34-13.800.
Ip, William W.; and Perlegos, Gust, to Seeq Technology, Inc. Redundancy circuit for use in a semiconductor memory array. 4,617,651, Cl. 365-200.000.
IPCO Corporation: *See—*
Weissman, Bernard, 4,616,999, Cl. 433-225.000.
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Irvine Sensors Corporation: *See—*
Belanger, Robert J.; and Bisignano, Alan G., 4,617,160, Cl. 264-40.100.
Irwin, Christopher; and Bowen, Richard M., to Hoover Universal, Inc. Method for blow molding articles with deeply recessed edges. 4,617,166, Cl. 264-531.000.
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Ishida, Toshio: *See—*
Suzuki, Toshifumi; Kawano, Toshio; Setoguchi, Ryoichi; Ishida, Toshio; and Mikami, Seiiti, 4,616,411, Cl. 29-822.000.
Ishii, Fumio: *See—*
Hotta, Yuji; Abe, Takao; Ishii, Fumio; Kitamura, Shigehiro; Koshizuka, Kunihiro; and Nakamura, Masaki, 4,617,224, Cl. 428-212.000.
Ishii, Hiroshi: *See—*
Koto, Haruhiko; Okada, Junichi; Ishii, Hiroshi; and Sawada, Kenji, 4,617,581, Cl. 346-140.00R.
Ishii, Kiyoshi: *See—*
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Ishii, Toshimasa: *See—*
Yoshizaki, Tsutomu; and Ishii, Toshimasa, 4,616,895, Cl. 339-17.0CF.
Ishimoto, Zenichi; and Konno, Tadashi, to Nikko Co., Ltd. Wireless controllable car with a winch mechanism. 4,617,002, Cl. 446-427.000.
Ishiwatari, Seishiro: *See—*
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Isobe, Kenichi: *See*—
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Itho, Joji, to Toyota Jidosha Kabushiki Kaisha. Painting booth. 4,616,594, Cl. 118-326.000.
Ito, Hiroshi: *See*—
Akashi, Teruo; Ito, Hiroshi; and Yamada, Shigemichi, 4,616,521, Cl. 74-335.000.
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Takahashi, Masaharu; Tokushige, Yuji; and Itoh, Kunio, 4,617,078, Cl. 156-307.500.
Itoigawa, Masakatsu; and Nishijima, Masaru, to Sharp Kabushiki Kaisha. Copying machine having an endless photoreceptor belt. 4,616,920, Cl. 355-3.0BE.
ITW Limited: *See*—
Hewison, George D., 4,616,455, Cl. 52-127.120.
Ivanov, Borislav; and Ivanova, Raina. Stator-Rotor piston internal combustion engine. 4,616,604, Cl. 123-55.0AA.
Ivanova, Raina: *See*—
Ivanov, Borislav; and Ivanova, Raina, 4,616,604, Cl. 123-55.0AA.
Ivarsson, Paul L.; Blom, Ingvar G. A.; and Berg, Lars G., to Hoganas AB. Refractory lining and process for its manufacture. 4,617,280, Cl. 501-84.000.
Ives, Albert G., to LOF Plastics Inc. Molded end cap for extruded trims. 4,617,209, Cl. 428-31.000.
Iwaki, Yuichi: *See*—
Kawamura, Kaoru; and Iwaki, Yuichi, 4,616,593, Cl. 118-303.000.
Iwamoto, Hiroshi: *See*—
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Iwamoto, Hisao; Kimura, Hiroyuki; and Iwamoto, Yoichi, to Kanebo Limited. Slide type cosmetic container with compound screw. 4,616,947, Cl. 401-69.000.
Iwamoto, Junjiro: *See*—
Sato, Kimihiko; Sajima, Yasuo; Nakao, Makoto; and Iwamoto, Junjiro, 4,617,101, Cl. 204-252.000.
Iwamoto, Yoichi: *See*—
Iwamoto, Hisao; Kimura, Hiroyuki; and Iwamoto, Yoichi, 4,616,947, Cl. 401-69.000.
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Inagaki, Mitsuo; Takeda, Kenji; Iwanami, Shigeki; Sasaya, Hideaki; and Nagasaku, Eiichi, 4,616,984, Cl. 418-150.000.
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Takenouchi, Tomoo; Ichinomiya, Yoshiaki; and Iwanami, Yoshiyuki, 4,617,052, Cl. 420-117.000.
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IXI Laboratories, Inc.: *See*—
Johnson, Ronald R.; and Rieckenberg, Randall K., 4,617,603, Cl. 361-149.000.
Iyer, Subramanian S.; and Joshi, Rajiv V., to International Business Machines Corporation. Method for differential selective deposition of metal for fabricating metal contacts in integrated semiconductor circuits. 4,617,087, Cl. 156-643.000.
Izu, Masatsugu: *See*—
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Izumida, Kiichiro; and Kasai, Ritaroh, to Mitsubishi Denki Kabushiki Kaisha. Artificial satellite attitude control system. 4,617,634, Cl. 364-455.000.
J. & K. Shephard Design Pty Limited: *See*—
Shephard, Kevin E., 4,616,423, Cl. 33-355.00R.
Jaccod, Michel; and de Briel, Jacques T., to Valeo. Speed change pulley with diaphragm spring and oil spring. 4,617,005, Cl. 474-14.000.
Jackson, Joseph F.; and Waite, Ralph A., to Pratt Burnerd International Limited. Work holding devices. 4,616,838, Cl. 279-4.000.
Jacomet, Joe A.: *See*—
Hiscock, Donald F.; Jacomet, Joe A.; and Carter, Deborah H., 4,617,223, Cl. 428-211.000.
Jacubert, Serge: *See*—
Verdier, Jean-Michel; Jacubert, Serge; Grosbois, Jean; and Dumousseau, Jean-Yves, 4,617,098, Cl. 204-68.000.
Jadamus, Hans: *See*—
Baciu, Antoine; Jadamus, Hans; and Bittscheidt, Josef, 4,617,618, Cl. 362-341.000.
Jaeneke, Christian: *See*—
Romer, Rudolf; Bethmann, Karl W.; Jaeneke, Christian; and Moll, Manfred, 4,616,567, Cl. 102-489.000.
Jahn, Dieter; Becker, Rainer; Keil, Michael; Himmele, Walter; and Wuerzer, Bruno, to BASF Aktiengesellschaft. Cyclohexane-1,3-dione derivatives. 4,617,050, Cl. 71-98.000.
Jane, Phillip A., to Perkins Engines Group Limited. Internal combustion engine piston. 4,616,612, Cl. 123-276.000.
Jang, Chan-Hwei. Jazz drumhead. 4,616,552, Cl. 84-414.000.
Jankowski, Leon V.: *See*—
Ballachey, John M.; Jankowski, Leon V.; Johnson, C. W.; Ward, George S.; and Ward, John R., 4,616,454, Cl. 52-115.000.
Jannuzzi, Michael A.: *See*—
Burniski, Edward W.; and Jannuzzi, Michael A., 4,616,598, Cl. 119-1.000.
Jantzen, Eric. Storage cabinet with multiple storage compartments. 4,616,891, Cl. 312-328.000.
Januszewski, Nicholas M.: *See*—
Moore, Alan R.; and Januszewski, Nicholas M., 4,616,580, Cl. 111-7.000.
Japan Constec Kabushiki Kaisha: *See*—
Taga, Kazumitsu, 4,616,954, Cl. 404-74.000.
Japan Electronic Control Systems Company Limited: *See*—
Tomisawa, Naoki, 4,617,509, Cl. 323-303.000.
Japan Steel Works Ltd., The: *See*—
Takenouchi, Tomoo; Ichinomiya, Yoshiaki; and Iwanami, Yoshiyuki, 4,617,052, Cl. 420-117.000.
Japan Styrene Paper Corporation: *See*—
Kuwabara, Hideki; Sudo, Yoshimi; and Kitagawa, Atusi, 4,617,323, Cl. 521-60.000.
Japan Tobacco & Salt Public Corporation, The: *See*—
Nagata, Tomizou, 4,616,475, Cl. 53-575.000.
Jaskowski, Michael C., to Helmic, Inc. Method for degumming and bleaching decorticated plant bast fiber. 4,617,383, Cl. 536-2.000.
Jason, Barry L. Signal detector. 4,617,474, Cl. 307-262.000.
Jayant, Nuggehally S.; and Ramamoorthy, Venkatasubbarao, to AT&T Bell Laboratories. Predictive communication system filtering arrangement. 4,617,676, Cl. 375-27.000.
Jean, Joseph A., Jr.; and Laurence, Lynne. Headband with detachable lenses. 4,616,367, Cl. 2-452.000.
Jean Walterscheid GmbH: *See*—
Bober, Helmut; Buthe, Theo; Coenen, Karl; Fartmann, Norbert; Herbertz, Klaus; Koch, Heinz; Kretschmer, Horst; Nienhaus, Clemens; Schardt, Peter; Schibrowski, Jurgen; and Schmandt, Willi, 4,617,003, Cl. 464-48.000.
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Jefatura de Ingenieros del Ejercito: *See*—
Perez, Juan J. B., 4,616,373, Cl. 14-72.500.
Jeffries, Alfred T., III: *See*—
Cordes, William F., III; and Jeffries, Alfred T., III, 4,617,252, Cl. 430-272.000.
Jelfs, Stewart D. Hydraulic frictional coupling. 4,616,948, Cl. 403-5.000.
Jenoptik Jena G.m.b.H.: *See*—
Zeth, Ulrich; Rempke, Wilfried; and Voigt, Klaus-Ditmar, 4,616,911, Cl. 354-66.000.
Jensen, Falle. Rotatable hydrostatic transmission. 4,616,478, Cl. 60-487.000.
Jergenson, Jerg B., to Hughes Aircraft Company. Preparation of liquid metal source structures for use in ion beam evaporation of boron-containing alloys. 4,617,203, Cl. 427-294.000.
Jervis B. Webb Company: *See*—
Dehne, Clarence A., 4,616,570, Cl. 104-172.00B.
Jetco, Inc.: *See*—
Davis, Bill G., 4,616,806, Cl. 251-63.400.
Jewell, Everett: *See*—
Sheppard, Isaac, Jr.; Jewell, Everett; Levitz, Steven E.; and Taylor, Rudolph T., 4,616,453, Cl. 52-93.000.
Jidoshi Kiki Co., Ltd.: *See*—
Suzuki, Yoshio; and Ohe, Takeshi, 4,616,728, Cl. 180-142.000.
Johansson, Jan: *See*—
Cewers, Goeran; Johansson, Jan; and Olsson, Sven-Gunnar, 4,616,801, Cl. 251-6.000.
Johansson, Jan H.; and Sundvall, Nils J., to Telefonaktiebolaget LM Ericsson. Method for current supply to a subscriber telephone from a telephone exchange. 4,617,426, Cl. 179-16.0AA.
Johansson, Sixten, to VOLVO BM AB. Device for turning an articulated motor vehicle. 4,616,726, Cl. 180-135.000.
John, Peter: *See*—
Rittner, Siegbert; Morach, Eugen; Schindler, Hubert; and John, Peter, 4,617,197, Cl. 427-180.000.
Johns, Allan T.; and Martin, Michael A., to National Research Development Corporation. Protection of electrical power supply systems. 4,617,636, Cl. 364-482.000.
Johns, David L., to Suncoast Medical Manufacturing, Inc. Variable alternating current output nerve locator/stimulator. 4,616,660, Cl. 128-741.000.
Johns, Thelma D. Quilting tool. 4,616,770, Cl. 223-101.000.
Johnsen, Andreas O., to Rohm GmbH. Apparatus for the photographic recording of plate thermography. 4,616,912, Cl. 354-80.000.
Johnson, C. W.: *See*—
Ballachey, John M.; Jankowski, Leon V.; Johnson, C. W.; Ward, George S.; and Ward, John R., 4,616,454, Cl. 52-115.000.
Johnson, Clyde O.: *See*—
Miranti, Joseph P., Jr.; Oliver, Larry R.; and Johnson, Clyde O., 4,617,007, Cl. 474-201.000.
Johnson, John D. System and method of controlling and preventing the spread of forest fires. 4,616,711, Cl. 169-45.000.
Johnson & Johnson Baby Products Company: *See*—
Lukenbach, Elvin R.; and Tenore, Richard R., 4,617,414, Cl. 558-87.000.
Johnson & Johnson Products, Inc.: *See*—
Saferstein, Lowell; Lindquist, Julius A.; and Wolf, Stephen J., 4,616,644, Cl. 128-156.000.
Johnson, Marvin M.: *See*—
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Johnson, Neil H.: *See*—
Giaier, Thomas A.; Johnson, Neil H.; Reschly, David C.; Knox, Harold L.; and Spurlock, Kim E., 4,616,573, Cl. 110-327.000.

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Johnson, Thomas A.: *See*—
Ford, Michael E.; and Johnson, Thomas A., 4,617,418, Cl. 564-479.000.

Johnston, Joseph G., to Bicron Corporation. Dead time compensation circuit for radiation detector. 4,617,680, Cl. 377-10.000.

Johnston, Mark E.: *See*—
Tullis, Barclay J.; Parikh, Mihir; Thrasher, David L.; and Johnston, Mark E., 4,616,683, Cl. 141-98.000.

Johnston, Russell A., to Camco, Incorporated. Control line protector for use on a well tubular member. 4,616,704, Cl. 166-242.000.

Jones, Edgerton G.: *See*—
Wallace, Norman R.; and Jones, Edgerton G., 4,616,955, Cl. 405-158.000.

Jones, Stephen D. Bicycle brake cable coupling means. 4,616,523, Cl. 74-501.000.

Jones, Thomas B., Jr.; and Nikkel, Willem A., to Westvaco Corporation. Glue applicator for single-faced corrugated web. 4,617,076, Cl. 156-205.000.

Jones, W. Kinzy: *See*—
Weinberg, Alvin H.; and Jones, W. Kinzy, 4,616,655, Cl. 128-419.00P.

Joo, Louis A.; Tucker, Kenneth W.; and Shaner, Jay R., to Great Lakes Carbon Corporation. Metal reinforced porous refractory hard metal bodies. 4,617,053, Cl. 75-244.000.

Jorgensen, Ray G. Row finder. 4,616,712, Cl. 172-6.000.

Jorn, Alfred, to Georg Fischer Aktiengesellschaft. Method and apparatus for producing a test piece of molding compound useful in measuring properties thereof. 4,616,508, Cl. 73-823.000.

Joshi, Rajiv V.: *See*—
Iyer, Subramanian S.; and Joshi, Rajiv V., 4,617,087, Cl. 156-643.000.

Jourdain, Philippe: *See*—
Cuvilliers, Bernard; and Jourdain, Philippe, 4,617,586, Cl. 357-80.000.

Jouwsma, Wijbren, to Bronkhorst High-Tech B.V. Fluid flow measuring device. 4,616,505, Cl. 73-204.000.

Joy Manufacturing Company: *See*—
McDaniel, Donald E., 4,616,725, Cl. 180-89.130.

Juell, Gaylord E.; and Lambert, Robert E. Airport runway light housing and method of installation. 4,617,616, Cl. 362-267.000.

Jung, Ha Y. Disposable ear protector. 4,616,643, Cl. 128-151.000.

Kaali, Steven; Schwolsky, Peter M.; and Porter, Joseph W., to Kaali, Steven; and Schwolsky, Peter M. Birth control method and device employing electric forces. 4,616,640, Cl. 128-130.000.

Kabushiki Kaisha Kato Kogei: *See*—
Kato, Niro, 4,616,544, Cl. 83-413.000.

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Takahashi, Nagashige, 4,616,631, Cl. 128-6.000.

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Ashikaga, Tadashi; Kamanaka, Yoshihide; and Fushimi, Keiko, 4,617,675, Cl. 375-22.000.

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Kawasaki, Yutaka, 4,617,435, Cl. 200-144.0AP.
Kohyama, Mitsuaki; and Shimazaki, Takashi, 4,616,918, Cl. 355-3.0DD.
Miwa, Yoshiyuki, 4,617,452, Cl. 219-441.000.
Mori, Seiichi, 4,616,402, Cl. 29-571.000.
Shinohe, Takashi; and Asaka, Masayuki, 4,617,583, Cl. 357-38.000.
Suzuki, Kouhei; Saito, Tamio; and Mori, Ken-ichi, 4,617,471, Cl. 250-578.000.
Takeuchi, Hiroshi, 4,616,401, Cl. 29-571.000.
Thai, Cao M.; Oguni, Takayuki; Kurematsu, Kazuhiko; and Kato, Tsuguo, 4,617,330, Cl. 523-220.000.
Utoh, Yoshihiro; Shibata, Shinichi; and Kitahara, Hiroyuki, 4,616,764, Cl. 220-306.000.
Yamauchi, Masahide; and Hirose, Minoru, 4,616,817, Cl. 271-9.000.
Yoshida, Yuzo, 4,617,465, Cl. 250-385.000.

Kachelman, Donald L.: *See*—
Salladay, David G.; and Kachelman, Donald L., 4,617,048, Cl. 71-30.000.

Kachi, Tadakatsu: *See*—
Takahashi, Kenzo; Kumazaki, Nobuo; Yokoya, Hisao; Nakamura, Hironobu; and Kachi, Tadakatsu, 4,616,695, Cl. 165-54.000.

Kaganowicz, Grzegorz, to RCA Corporation. Apparatus for making a plasma coating. 4,616,597, Cl. 118-723.000.

Kagemann, Heinz. Suspended ceiling. 4,616,463, Cl. 52-665.000.

Kageyama, Takafumi: *See*—
Watanabe, Katsushi; Kageyama, Takafumi; Kano, Taisaku; Hirai, Koichi; and Ichihara, Yoshinobu, 4,617,367, Cl. 526-273.000.

Kahale, Abed G.: *See*—
Hanssen, Tore B.; and Kahale, Abed G., 4,617,432, Cl. 200-81.00R.

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Maruyama, Hitoshi; Kajitani, Koichi; and Shiraishi, Makoto, 4,617,239, Cl. 428-452.000.

Kakegawa, Hisao: *See*—
Satoh, Toshio; Miyataka, Hideki; Masamoto, Yukimitsu; Asai, Takashi; Hasegawa, Kenji; and Kakegawa, Hisao, 4,617,292, Cl. 514-27.000.

Kamamori, Hitoshi; Suginoya, Mitsuru; Iwasa, Koji; Sano, Yutaka; and Terada, Yumiko, to Seiko Instruments & Electronics Ltd. Method of manufacturing solid state color filter device uses co-electrodeposition. 4,617,094, Cl. 204-18.100.

Kamanaka, Yoshihide: *See*—
Ashikaga, Tadashi; Kamanaka, Yoshihide; and Fushimi, Keiko, 4,617,675, Cl. 375-22.000.

Kamijyo, Yoshimi: *See*—
Sone, Takehiko; Takoshima, Takehiro; and Kamijyo, Yoshimi, 4,617,487, Cl. 310-313.00D.

Kamimura, Kuniaki: *See*—
Saijo, Takao; Saito, Takanori; Kamimura, Kuniaki; and Fujita, Masafumi, 4,616,925, Cl. 355-44.000.

Kanai, Masatatsu: *See*—
Suzuki, Hiroshi; Kanai, Masatatsu; Saitoh, Seishiro; and Kanai, Shigeru, 4,616,876, Cl. 297-328.000.

Kanai, Seita; and Hirochika, Takashi, to Mazda Motor Corporation. Suspension system for vehicle. 4,616,847, Cl. 280-707.000.

Kanai, Shigeru: *See*—
Suzuki, Hiroshi; Kanai, Masatatsu; Saitoh, Seishiro; and Kanai, Shigeru, 4,616,876, Cl. 297-328.000.

Kanasaki, Kazuharu: *See*—
Ueki, Toru; Fukuda, Yoshiaki; Usami, Katsuyuki; and Kanasaki, Kazuharu, 4,617,207, Cl. 428-1.000.

Kanebo Limited: *See*—
Iwamoto, Hisao; Kimura, Hiroyuki; and Iwamoto, Yoichi, 4,616,947, Cl. 401-69.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Senda, Kenichi; Ando, Masao; Nakamura, Kyoichi; and Nishida, Tatehiko, 4,617,322, Cl. 521-60.000.

Kaneko, Tetsuya: *See*—
Tanaka, Kiyoshi; Koga, Yoshihiro; Saeki, Masaru; Kaneko, Tetsuya; and Kawakita, Tetsuya, 4,617,155, Cl. 260-501.120.

Kanesaki, Tateo; and Utsumi, Shigeo, to Diafoil Company, Limited. Process for stretching polyester films. 4,617,164, Cl. 264-235.800.

Kanetsuna, Nobumitsu: *See*—
Kishino, Takao; Marushima, Ikuo; and Kanetsuna, Nobumitsu, 4,617,491, Cl. 313-497.000.

Kanmuri, Yoshihiro: *See*—
Shinonome, Osami; Ikeda, Takasi; Kanmuri, Yoshihiro; and Matuoka, Fumio, 4,617,235, Cl. 428-374.000.

Kano, Taisaku: *See*—
Watanabe, Katsushi; Kageyama, Takafumi; Kano, Taisaku; Hirai, Koichi; and Ichihara, Yoshinobu, 4,617,367, Cl. 526-273.000.

Kao Soap Co., Ltd.: *See*—
Nogami, Takashi; and Nawa, Masayoshi, 4,617,243, Cl. 429-194.000.

Karcher, Ralph E., Jr.; and Greene, Blandford W., to USM Corporation. Receiving belt blowback arrangement. 4,616,592, Cl. 118-202.000.

Karras, James: *See*—
Morley, Edmond; DiLorenzo, Neil; and Karras, James, 4,616,474, Cl. 53-556.000.

Kasai, Ritaroh: *See*—
Izumida, Kiichiro; and Kasai, Ritaroh, 4,617,634, Cl. 364-455.000.

Kasai, Yasuhiro, to Yamaha Hatsudoki Kabushiki Kaisha. Transmission chain adjuster for motorcycles. 4,616,729, Cl. 180-231.000.

Kassai, Kenzou, to Aprica Kassai Kabushikikaisha. Bed for baby carriages. 4,616,371, Cl. 5-99.00A.

Kassai, Kenzou, to Aprica Kassai Kabushikikaisha. Mechanism for locking opened state of baby carriage. 4,616,844, Cl. 280-650.000.

Katagiri, Hidenori: *See*—
Miura, Hirohisa; Satou, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,617,055, Cl. 75-251.000.

Katagiri, Koichi; Hanamoto, Yoshihiro; Maeda, Satoru; and Taniguchi, Ikuo, to Nippon Telegraph and Telephone Corp.; and Sony Corporation. Signal generator circuit. 4,617,594, Cl. 358-150.000.

Kato, Hisatoyo: *See*—
Shiraishi, Hisashi; Kato, Hisatoyo; and Miyahara, Junji, 4,617,468, Cl. 250-484.100.

Kato, Niro, to Kabushiki Kaisha Kato Kogei. Cutting machine for preparing models for spectacle lenses. 4,616,544, Cl. 83-413.000.

Kato, Tsuguo: *See*—
Thai, Cao M.; Oguni, Takayuki; Kurematsu, Kazuhiko; and Kato, Tsuguo, 4,617,330, Cl. 523-220.000.

Katoh, Tutomu, to Sharp Kabushiki Kaisha. Hinge structure with torsion bar for electrophotographic copying machine. 4,616,765, Cl. 220-335.000.

Katou, Kazuo; Mizugami, Susumu; Tabuchi, Mamoru; Nakamura, Masayuki; Kobayashi, Toshiyuki; and Ritoh, Naotake, to Kawasaki Steel Corporation; and Mitsubishi Denki Kabushiki Kaisha. Cutter for a welding apparatus. 4,616,545, Cl. 83-558.000.

Katsumata, Ryoichi; and Furuya, Akira, to Kyowa Hakko Kogyo Co., Ltd. Plasmid pCG1 from *Corynebacterium glutamicum*. 4,617,267, Cl. 435-91.000.

Katzorek, Karl-Hermann: *See*—
Ehrlinger, Friedrich; Katzorek, Karl-Hermann; Dziuba, Peter; Veser, Karl; and Caspar, Peter, 4,616,520, Cl. 74-325.000.

Kautex-Werke Reinold Hagen AG: *See*—
Giese, Peter; Holzmann, Rainer; Schwochert, Hans-Joachim; and Thomas, Alfred, 4,617,077, Cl. 156-245.000.

Kavlico Corporation: *See*—
Park, Kyong; and Chen, Hung-Chih, 4,617,607, Cl. 361-283.000.

Kawada, Akira: *See*—
Maeda, Kazuhiko; and Kawada, Akira, 4,617,350, Cl. 525-153.000.

Kawaguchi, Hiroyuki; Saito, Hideyuki; and Yasuhara, Seishi, to Nissan Motor Company, Limited. Method and system for controlling idling speed for a Diesel engine. 4,616,615, Cl. 123-339.000.

Kawai, Yoshio; Kitagawa, Kiyoshi; Endo, Kazue; and Onodera, Chikau, to Kureha Kagaku Kogyo Kabushiki Kaisha. Cell unit for observing electrophoresis. 4,617,104, Cl. 204-301.000.

Kawakami, Hiroshi: *See*—
Wakaizumi, Akira; and Kawakami, Hiroshi, 4,617,035, Cl. 55-389.000.

Kawakami, Takeshi: *See*—
Tamaki, Akinobu; Kimura, Ken; Kawakami, Takeshi; and Irie, Masao, 4,616,407, Cl. 29-596.000.

Kawaken Fine Chemicals Co., Ltd.: *See*—
Ito, Kazuhisa; and Fukuda, Yoshio, 4,617,400, Cl. 548-317.000.

Kawakita, Tetsuya: *See*—
Tanaka, Kiyoshi; Koga, Yoshihiro; Saeki, Masaru; Kaneko, Tetsuya; and Kawakita, Tetsuya, 4,617,155, Cl. 260-501.120.

Kawamura, Kaoru; and Iwaki, Yuichi, to Yoshida Kogyo K. K. Paint supply apparatus for rotary painting machine. 4,616,593, Cl. 118-303.000.

Kawamura, Masaharu: *See*—
Suzuki, Masayuki; Fukahori, Hidehiko; Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; and Ohara, Tsunemasa, 4,616,913, Cl. 354-173.100.

Kawamura, Masanori: *See*—
Harakon, Katsuyuki; and Kawamura, Masanori, 4,616,685, Cl. 152-209.00R.

Kawano, Toshio: *See*—
Suzuki, Toshifumi; Kawano, Toshio; Setoguchi, Ryoichi; Ishida, Toshio; and Mikami, Seiiti, 4,616,411, Cl. 29-822.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Nozaki, Yasuo; Oishi, Yoshikazu; and Koga, Takanori, 4,616,880, Cl. 299-39.000.

Kawasaki Steel Corporation: *See*—
Katou, Kazuo; Mizugami, Susumu; Tabuchi, Mamoru; Nakamura, Masayuki; Kobayashi, Toshiyuki; and Ritoh, Naotake, 4,616,545, Cl. 83-558.000.

Kawasaki, Yutaka, to Kabushiki Kaisha Toshiba. Hybrid circuit breaker. 4,617,435, Cl. 200-144.0AP.

Kawashima, Masamichi: *See*—
Murata, Mitsuru; Kobayashi, Toyohiro; Mochizuki, Shoji; and Kawashima, Masamichi, 4,616,946, Cl. 400-704.000.

Kaye, Alan S., to United Kingdom Atomic Energy Authority. Aerodynamic windows for high power lasers. 4,617,670, Cl. 372-104.000.

Keenan, Anthony F.: *See*—
Keenan, Phillip R.; and Keenan, Anthony F., 4,616,370, Cl. 5-2.00R.

Keenan, Bert: *See*—
Reed, Dennis A., 4,617,278, Cl. 436-60.000.

Keenan, Phillip R.; and Keenan, Anthony F. Furniture. 4,616,370, Cl. 5-2.00R.

Keil, Michael: *See*—
Jahn, Dieter; Becker, Rainer; Keil, Michael; Himmele, Walter; and Wuerzer, Bruno, 4,617,050, Cl. 71-98.000.

Kellner, Andrew. Steering knuckle for a velocipede. 4,616,949, Cl. 403-104.000.

Kellogg, Walter J.; DeVault, Birch L.; and Paape, Kenneth L., to Westinghouse Electric Corp. Electrical control apparatus with electromagnetic latch. 4,617,546, Cl. 337-170.000.

KemStone Manufacturing, Inc.: *See*—
Yoder, Andrew H.; and Rhodes, Richard A., 4,616,457, Cl. 52-218.000.

Kennecott Corporation: *See*—
Chandler, Richard C.; and Amra, Lutfi H., 4,617,232, Cl. 428-328.000.
Shaftel, Myles A., 4,617,511, Cl. 324-54.000.

Kennedy, Earl E.: *See*—
Knobel, Thomas M.; Kennedy, Earl E.; and Walker, Mary A., 4,617,325, Cl. 521-105.000.

Keogh, Michael J.; Wallace, Scott L.; and Brown, Geoffrey D., to Union Carbide Corporation. Compositions based on alkylene-alkyl acrylate copolymers and silanol condensation catalysts. 4,617,338, Cl. 524-437.000.

Kerivan, Leo J., to Precision Handling Devices Inc. Forms feeding apparatus. 4,616,773, Cl. 225-99.000.

Kernforschungszentrum Karlsruhe GmbH: *See*—
Vogg, Hubert, 4,617,180, Cl. 423-240.000.

Kersten, Jean; and Mathias, Jean M., to Baxter Travenol Laboratories, Inc. Port and closure assembly for a container. 4,616,760, Cl. 215-232.000.

Kerwar, Suresh S.; Sloboda, Adolph E.; and Ridge, Susan C., to American Cyanamid Company. Method of treating multiple sclerosis. 4,617,319, Cl. 514-647.000.

Keystone International, Inc.: *See*—
Schils, Petrus J. R., 4,616,803, Cl. 251-14.000.

Kidde, Inc.: *See*—
Leavitt, George E.; and LoStracco, Felice, 4,616,928, Cl. 356-338.000.

Kiely, Donald E.; and Seidman, Martin, to A. E. Staley Manufacturing Company. Preparation of alpha, beta-unsaturated carbonyl compounds. 4,617,405, Cl. 549-262.000.

Kijimuta, Hitoshi: *See*—
Manabe, Tsuneo; Kobayashi, Shigeyoshi; and Kijimuta, Hitoshi, 4,617,279, Cl. 501-10.000.

Kimball International, Inc.: *See*—
Slaats, Mathew A.; and Blesinger, James E., 4,616,877, Cl. 297-353.000.

Kimberly-Clark Corporation: *See*—
Martin, Jeffrey A.; and Pomeroy, Philip S., 4,616,642, Cl. 128-132.00D.
Oshefsky, Daniel J.; Gavronski, Paul A.; Vogt, Robert E.; and Rajala, Gregory J., 4,617,082, Cl. 156-447.000.

Kimura, Atsushi: *See*—
Mori, Makihiko; Nakamura, Kazuo; Tanabe, Kanichiro; and Kimura, Atsushi, 4,617,682, Cl. 382-28.000.

Kimura, Hiroshi; Hisajima, Masahiko; Shibata, Kiyoshi; and Morimoto, Kiyoshi, to Mita Kogyo Kabushiki Kaisha. Cleaning device for use with transfer type electrostatic copying machines. 4,616,924, Cl. 355-15.000.

Kimura, Hiroyuki: *See*—
Iwamoto, Hisao; Kimura, Hiroyuki; and Iwamoto, Yoichi, 4,616,947, Cl. 401-69.000.

Kimura, Ken: *See*—
Tamaki, Akinobu; Kimura, Ken; Kawakami, Takeshi; and Irie, Masao, 4,616,407, Cl. 29-596.000.

King, Dallas E.: *See*—
Frey, Mark W.; King, Dallas E.; and Staker, William C., 4,616,527, Cl. 74-625.000.

King, Herbert R., to Milliken Research Corporation. Air comb arrangement for jet dyeing machine. 4,616,794, Cl. 248-67.500.

King, L. Tony, to Komax Systems, Inc. Intermittent mixing apparatus. 4,616,937, Cl. 366-336.000.

King, Michael C., to GCA Corporation. Microlithographic system. 4,616,908, Cl. 350-576.000.

King, Peter F., to Parker Chemical Company. Composition and process for treatment of ferrous substrates. 4,617,068, Cl. 148-6.14R.

Kinoshita, Akihiro; Namariyama, Yohichi; and Higashi, Hiromi, to Chisso Corporation. Process for forming detailed images. 4,617,254, Cl. 430-326.000.

Kirby, Robert L.: *See*—
Howard, H. Keith; Sherrill, Jimmy L.; and Kirby, Robert L., 4,617,547, Cl. 338-317.000.

Kircher, Dieter; von Gruenberg, Hubertus; Blum, Klaus D.; and Becker, Peter, to Alfred Teves GmbH. Hydraulic steering force booster. 4,616,727, Cl. 180-142.000.

Kirchlechner, Richard: *See*—
Wahlig, Helmut; Dingeldein, Elvira; Kirchlechner, Richard; Orth, Dieter; and Rogalski, Werner, 4,617,293, Cl. 514-41.000.

Kirker, Garry W.: *See*—
Bell, Weldon K.; Haag, Werner O.; Kirker, Garry W.; and Klocke, Donald J., 4,617,288, Cl. 502-331.000.

Kirkwood, Marda K.; and Olson, Keith E., to Economics Laboratory, Inc. Enzyme drying process. 4,617,272, Cl. 435-183.000.

Kirsten, Walter, to BKW Handels-und Vertriebsgesellschaft. Portable projection apparatus. 4,616,787, Cl. 241-275.000.

Kishi, Hajimu; Onuki, Tadayoshi; and Kurakake, Mitsuo, to Fanuc Ltd. Portable automatic NC programming device. 4,617,640, Cl. 364-708.000.

Kishimoto, Yoshio: *See*—
Hosaka, Tomiharu; Kishimoto, Yoshio; and Shimotsuma, Wataru, 4,617,356, Cl. 525-429.000.

Kishino, Takao; Marushima, Ikuo; and Kanetsuna, Nobumitsu, to Futaba Denshi Kogyo K.K. Fluorescent display device with interleaved anode and control electrode segments. 4,617,491, Cl. 313-497.000.

Kita, Nobuyuki: *See*—
Nakakita, Eiji; Koike, Akinobu; Sekiya, Toshiyuki; Misu, Hiroshi; and Kita, Nobuyuki, 4,617,250, Cl. 430-175.000.

Kitagawa, Atusi: *See*—
Kuwabara, Hideki; Sudo, Yoshimi; and Kitagawa, Atusi, 4,617,323, Cl. 521-60.000.

Kitagawa, Kiyoshi: *See*—
Kawai, Yoshio; Kitagawa, Kiyoshi; Endo, Kazue; and Onodera, Chikau, 4,617,104, Cl. 204-301.000.

Kitahara, Hiroyuki: *See*—
Utoh, Yoshihiro; Shibata, Shinichi; and Kitahara, Hiroyuki, 4,616,764, Cl. 220-306.000.

Kitamura, Shigehiro: *See*—
Hotta, Yuji; Abe, Takao; Ishii, Fumio; Kitamura, Shigehiro; Koshizuka, Kunihiro; and Nakamura, Masaki, 4,617,224, Cl. 428-212.000.

Kitanaka, Katsumi. Divided-bucket type rotary excavator. 4,616,720, Cl. 175-267.000.

Klaren, Dick G., to Esmil BV. Heat exchanger for liquid/liquid heat exchanger. 4,616,698, Cl. 165-104.160.

Klaus, Michael: *See*—
Helmlinger, Daniel; Pesaro, Mario; and Klaus, Michael, 4,617,146, Cl. 252-522.00R.

Klein, Robert E. Visual indicator on soft contact lenses. 4,616,910, Cl. 351-162.000.

Kleiner, Gerhard A.: *See*—
Green, Michael J.; and Kleiner, Gerhard A., 4,617,412, Cl. 556-446.000.

Kline, Herbert E. Two-cycle engine with improved scavenging. 4,616,605, Cl. 123-65.0VD.

Klock, Anita H.; and Chodak, Jan B., to Mattel, Inc. Syntax error correction method and apparatus. 4,617,643, Cl. 364-900.000.

Klocke, Donald J.: *See*—
Bell, Weldon K.; Haag, Werner O.; Kirker, Garry W.; and Klocke, Donald J., 4,617,288, Cl. 502-331.000.
Klockner-Humboldt-Deutz AG: *See*—
Epper, Wolfgang; and Florenz, Johannes, 4,617,010, Cl. 494-52.000.
Klotz, Dell E. Multicolored liquid crystal display. 4,617,562, Cl. 340-753.000.
Klug, Ralph W.: *See*—
Bevilacqua, Bruce W.; Klug, Ralph W.; Carlsen, David C.; and Dinucci, Dennis J., 4,616,498, Cl. 72-53.000.
Knebel, Fritz; and Dassel, Rudolf, to Beler-Dowiday GmbH Werkzeug-Union. Wrench. 4,616,536, Cl. 81-128.000.
Knell, Harvey A.; and Rumble, Lloyd B., to Caterpillar Inc. Ripping bucket arrangement. 4,616,433, Cl. 37-141.00T.
Knepper, Paul A. Method for the prevention of ocular hypertension, treatment of glaucoma and treatment of ocular hypertension. 4,617,299, Cl. 514-178.000.
Knobel, Thomas M.; Kennedy, Earl E.; and Walker, Mary A., to Dow Chemical Company, The. Organic polymers containing antistatic agents comprising the polymer having dispersed therein a non-volatile ionizable metal salt and a phosphate ester. 4,617,325, Cl. 521-105.000.
Knop, Klaus; and Heinrich, Peter, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Method of operating a reactor for synthesis gas production. 4,617,051, Cl. 75-91.000.
Knox, Harold L.: *See*—
Giaier, Thomas A.; Johnson, Neil H.; Reschly, David C.; Knox, Harold L.; and Spurlock, Kim E., 4,616,573, Cl. 110-327.000.
Ko, Wen C.: *See*—
Wang, Scott W.; Thomas, Mammen; and Ko, Wen C., 4,616,404, Cl. 29-576.00B.
Kobayashi, Hiroshi; Hirose, Tsuguhiro; and Haruyama, Hideaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Information transmission system with modems coupled to a common communication medium. 4,617,656, Cl. 370-74.000.
Kobayashi, Masaharu: *See*—
Noguchi, Takaharu; Kobayashi, Masaharu; Arai, Takao; and Shibuya, Toshifumi, 4,617,599, Cl. 360-32.000.
Kobayashi, Masahiko: *See*—
Akira, Takashima; Kobayashi, Masahiko; Nasu, Hitoo; Okida, Yoshishiro; and Tsuji, Kazuhiko, 4,616,872, Cl. 296-190.000.
Kobayashi, Ryuichi: *See*—
Suzuki, Masayuki; Fukahori, Hidehiko; Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; and Ohara, Tsunemasa, 4,616,913, Cl. 354-173.100.
Kobayashi, Shigeyoshi: *See*—
Manabe, Tsuneo; Kobayashi, Shigeyoshi; and Kijimuta, Hitoshi, 4,617,279, Cl. 501-10.000.
Kobayashi, Toshiyuki: *See*—
Katou, Kazuo; Mizugami, Susumu; Tabuchi, Mamoru; Nakamura, Masayuki; Kobayashi, Toshiyuki; and Ritoh, Naotake, 4,616,545, Cl. 83-558.000.
Kobayashi, Toyohiro: *See*—
Murata, Mitsuru; Kobayashi, Toyohiro; Mochizuki, Shoji; and Kawashima, Masamichi, 4,616,946, Cl. 400-704.000.
Kobayashi, Youichi; and Murakami, Susumu, to Sony Corporation. Film laminating apparatus. 4,617,080, Cl. 156-359.000.
Koch, Dieter: *See*—
Reichl, Bernhard; Maurath, Rudolf; Koch, Dieter; and Hametner, Gerhard, 4,616,841, Cl. 280-432.000.
Koch, Heinz: *See*—
Bober, Helmut; Buthe, Theo; Coenen, Karl; Fartmann, Norbert; Herbertz, Klaus; Koch, Heinz; Kretschmer, Horst; Nienhaus, Clemens; Schardt, Peter; Schibrowski, Jurgen; and Schmandt, Willi, 4,617,003, Cl. 464-48.000.
Kochs Adler, AG: *See*—
Scholl, Hans, 4,616,586, Cl. 112-320.000.
Kodama, Hisashi; and Ono, Takuro, to Aisin Seiki Kabushiki Kaisha. Valve driving device for internal combustion engine. 4,616,607, Cl. 123-90.460.
Kodama, Keiichi: *See*—
Asano, Tetsuji; Kodama, Keiichi; and Shigeki, Terumitsu, 4,617,213, Cl. 428-36.000.
Koga, Kiyoshi: *See*—
Furuya, Kunitaka; Inagaki, Hiromi; Koga, Kiyoshi; Yorita, Masaru; Fukatsu, Tsunehiko; and Matsuura, Kazuo, 4,616,846, Cl. 280-673.000.
Koga, Takanori: *See*—
Nozaki, Yasuo; Oishi, Yoshikazu; and Koga, Takanori, 4,616,880, Cl. 299-39.000.
Koga, Yoshihiro: *See*—
Tanaka, Kiyoshi; Koga, Yoshihiro; Saeki, Masaru; Kaneko, Tetsuya; and Kawakita, Tetsuya, 4,617,155, Cl. 260-501.120.
Kohama, Tokio: *See*—
Saito, Kimitaka; Kohama, Tokio; Egami, Tsuneyuki; Saito, Tsutomu; Takahashi, Hiroshi; and Sato, Kunihiko, 4,616,619, Cl. 123-489.000.
Kohara, Hideo: *See*—
Hattori, Toshihiko; Akagi, Yuji; and Kohara, Hideo, 4,616,985, Cl. 418-173.000.
Kohler, Peter; Ringe, Peter; and Heine, Heinrich, to Bayer Aktiengesellschaft. Mixed phases having the composition $Bi_{2-x}Cr_xO_3$. 4,617,061, Cl. 106-302.000.
Kohyama, Mitsuaki; and Shimazaki, Takashi, to Kabushiki Kaisha Toshiba. Developing apparatus. 4,616,918, Cl. 355-3.0DD.
Koide, Satoshi; and Hiejima, Kiyoshi, to Sanyo Electric Co., Ltd. Temperature controlled induction heating and cooking apparatus. 4,617,441, Cl. 219-10.770.
Koike, Akinobu: *See*—
Nakakita, Eiji; Koike, Akinobu; Sekiya, Toshiyuki; Misu, Hiroshi; and Kita, Nobuyuki, 4,617,250, Cl. 430-175.000.
Kojima, Yuichi; and Fukuda, Shinichi, to Sony Corporation. Method and apparatus for converting a digital data. 4,617,552, Cl. 340-347.0DD.
Kolb, Dieter: *See*—
Tomm, Dagwin; Kolb, Dieter; Gehrig, Siegmund; and Meyer, Alfred, 4,616,744, Cl. 192-109.00R.
Komax Systems, Inc.: *See*—
King, L. Tony, 4,616,937, Cl. 366-336.000.
Komiya, Yoshiyuki, to Nippon Thompson Co., Ltd. Dust-free rolling-contact bearing assembly. 4,616,885, Cl. 384-15.000.
Komplin, Steven R., to International Business Machines Corporation. Correction feed mechanism in a correction tape cartridge. 4,616,945, Cl. 400-697.100.
Kondo, Tadashi: *See*—
Morisawa, Kunio; and Kondo, Tadashi, 4,616,526, Cl. 74-606.00R.
Konishiroku Photo Industry Co., Ltd.: *See*—
Hotta, Yuji; Abe, Takao; Ishii, Fumio; Kitamura, Shigehiro; Koshizuka, Kunihiro; and Nakamura, Masaki, 4,617,224, Cl. 428-212.000.
Menjo, Hiroshi; Sakamoto, Nobuo; and Watanabe, Yoshikazu, 4,617,258, Cl. 430-566.000.
Konno, Tadashi: *See*—
Ishimoto, Zenichi; and Konno, Tadashi, 4,617,002, Cl. 446-427.000.
Kopp, Walter, to Adam Equipment Corp. Variable piston arrangment for roll and bread dividing and shaping machine. 4,616,990, Cl. 425-239.000.
Koren, Jeffrey G.: *See*—
Boberski, William G.; Nugent, Richard M.; and Koren, Jeffrey G., 4,617,331, Cl. 523-420.000.
Koshizuka, Kunihiro: *See*—
Hotta, Yuji; Abe, Takao; Ishii, Fumio; Kitamura, Shigehiro; Koshizuka, Kunihiro; and Nakamura, Masaki, 4,617,224, Cl. 428-212.000.
Kossmehl, Gerhard; and Hocker, Jurgen, to Bayer Aktiengesellschaft. Oxidizing polymerization with AsF_5. 4,617,143, Cl. 252-500.000.
Kosugi, Masao: *See*—
Takahashi, Kazuo; Sato, Hiroshi; and Kosugi, Masao, 4,617,469, Cl. 250-548.000.
Kotaka, Ikuo, to Babcock-Hitachi Kabushiki Kaisha. Heat exchanger. 4,616,697, Cl. 165-104.140.
Kotera, Yoshikazu, to Mitsubishi Denki Kabushiki Kaisha. Method of and apparatus for controlling load distribution for a continuous rolling mill. 4,616,494, Cl. 72-8.000.
Koto, Haruhiko; Okada, Junichi; Ishii, Hiroshi; and Sawada, Kenji, to Epson Corporation. Ink jet printer of the ink-on-demand type. 4,617,581, Cl. 346-140.00R.
Kouge, Shinichi: *See*—
Morishita, Mitsuharu; and Kouge, Shinichi, 4,617,626, Cl. 364-424.000.
Kowalyshen, Henry W., to S&C Electric Company. Nozzle and retaining arrangement. 4,616,856, Cl. 285-92.000.
Koyama, Hiroshi: *See*—
Nagashima, Hironobu; and Koyama, Hiroshi, 4,616,636, Cl. 128-23.000.
Kraft, Harald: *See*—
Habert, Guy; and Kraft, Harald, 4,616,963, Cl. 407-114.000.
Kraftwerk Union Aktiengesellschaft: *See*—
Engelhard, Gerhard; Pellkofer, Dieter; Bohm, Jurgen; and Forner, Siegfried, 4,617,444, Cl. 219-75.000.
Suchy, Peter, 4,617,170, Cl. 376-438.000.
Kramer, Daniel P.; and Massey, Richard T., to United States of America, Energy. Method for forming glass-to-metal seals. 4,617,044, Cl. 65-49.000.
Krause, Charles A.; and Vander Heyden, Randy J., to Zenith Electronics Corporation. Keyboard scanning. 4,617,554, Cl. 340-365.00E.
Krause, Joachim: *See*—
Eidenschink, Rudolf; and Krause, Joachim, 4,617,140, Cl. 252-299.610.
Krause, Richard H.; Pfeiffer, Thomas J.; and Horvath, Vincent V., to Bethlehem Steel Corporation. Method and system for determining mass temperature in a hostile environment. 4,617,638, Cl. 364-557.000.
Krauss, Ernst: *See*—
Haas, Rudiger; Krauss, Ernst; and Walter, Herbert, 4,616,447, Cl. 51-59.0SS.
Krechel, Joseph L.; and Purvis, Michael J., to Control Devices, Incorporated. Manifold fitting for a compressed air tank. 4,616,677, Cl. 137-881.000.
Kretchmer, Richard A.: *See*—
Tolpin, Thomas W.; and Kretchmer, Richard A., 4,617,175, Cl. 422-171.000.
Kretschmer, Horst: *See*—
Bober, Helmut; Buthe, Theo; Coenen, Karl; Fartmann, Norbert; Herbertz, Klaus; Koch, Heinz; Kretschmer, Horst; Nienhaus, Clemens; Schardt, Peter; Schibrowski, Jurgen; and Schmandt, Willi, 4,617,003, Cl. 464-48.000.
Kreuzer, Justin: *See*—
LaFiandra, Carlo; and Kreuzer, Justin, 4,617,681, Cl. 378-34.000.

Krivak, Thomas G.; Heimburger, Stanley A.; and Dew, James T., to PPG Industries, Inc. Animal feed supplement. 4,617,294, Cl. 514-52.000.

Kronenberg, Stanley, to United States of America, Army. Sampling and recording dose rate meter. 4,617,464, Cl. 250-377.000.

Kronogard, Clas-Olof: *See—*
Kronogard, Sven-Olof; Kronogard, Clas-Olof; and Kronogard, Hakan, 4,616,482, Cl. 60-624.000.

Kronogard, Hakan: *See—*
Kronogard, Sven-Olof; Kronogard, Clas-Olof; and Kronogard, Hakan, 4,616,482, Cl. 60-624.000.

Kronogard, Sven-Olof; Kronogard, Clas-Olof; and Kronogard, Hakan, to AB Volvo. Turbocharging device for an internal combustion engine. 4,616,482, Cl. 60-624.000.

Krueger, Duane A.; and Odorzynski, Thomas W., to American Can Company. Coextruded film of polypropylene, polypropylene blend, and nylon. 4,617,240, Cl. 428-476.100.

Krug, Herbert: *See—*
Dockner, Toni; Hagen, Helmut; and Krug, Herbert, 4,617,395, Cl. 546-178.000.

Krupp Polysius AG: *See—*
Schulte, Hans-Gerd, 4,616,575, Cl. 110-345.000.

Kruse, Barbara L.; Gronli, Darrell D.; and Gronholz, Donald D., to Donaldson Company, Inc. Crimp seal pleated filter assembly. 4,617,122, Cl. 210-493.300.

Kruse, Lyle W.; and McKnight, Richard P., to United States of America, Energy. Underwater radiation detector. 4,617,167, Cl. 376-153.000.

Kuan, Tiong H., to GenCorp Inc. Bushing. 4,617,212, Cl. 428-36.000.

Kubelbock, Alfred: *See—*
Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,617,672, Cl. 373-79.000.

Kubis, Heribert; and Winter, Josef, to M.A.N. Nutzfahrzeuge GmbH. Cylinder liner for a multi-cylinder internal combustion engine and an engine block therefor. 4,616,603, Cl. 123-41.840.

Kubo, Akio. Measuring device for a figure. 4,616,419, Cl. 33-122.000.

Kubo, Keiji: *See—*
Tanaka, Shigemori; Sumino, Fumio; Kubo, Keiji; Hisamura, Masafumi; Toma, Hitoshi; and Fujimura, Naoto, 4,617,245, Cl. 430-58.000.

Kuboki, Shigeo; Maejima, Higeo; and Masuda, Ikuro, to Hitachi, Ltd. Semiconductor integrated circuit device. 4,617,648, Cl. 365-189.000.

Kubota, Ltd.: *See—*
Akira, Takashima; Kobayashi, Masahiko; Nasu, Hitoo; Okida, Yoshishiro; and Tsuji, Kazuhiko, 4,616,872, Cl. 296-190.000.

Kubota, Takashi: *See—*
Inoue, Fumio; Eto, Masahiro; and Kubota, Takashi, 4,617,591, Cl. 358-67.000.

Kubozuka, Takao: *See—*
Hirano, Yoshinori; and Kubozuka, Takao, 4,616,602, Cl. 123-41.270.

Kuechler, Irvin R. Ventilation system for pizza ovens. 4,616,562, Cl. 98-115.100.

Kugele, Thomas G.; Mesch, Keith A.; and Wursthorn, Karl R., to Morton Thiokol, Inc. Stabilizer compositions for PVC. 4,617,334, Cl. 524-177.000.

Kuhn, Kelin J., to Board of Trustees, Leland Stanford, Jr. University. Method and apparatus for pumping lasant slabs. 4,617,669, Cl. 372-70.000.

Kuhn, Werner; and Zilske, Wolfgang, to Degussa Aktiengesellschaft. Bath and process for the electrolytic deposition of gold-indium alloys. 4,617,096, Cl. 204-44.300.

Kulkarni, Sudhir S.: *See—*
Funk, Edward W.; Kulkarni, Sudhir S.; and Chang, Y. Alice, 4,617,126, Cl. 210-651.000.

Kumazaki, Nobuo: *See—*
Takahashi, Kenzo; Kumazaki, Nobuo; Yokoya, Hisao; Nakamura, Hironobu; and Kachi, Tadakatsu, 4,616,695, Cl. 165-54.000.

Kumon, Seiichi, to Mitsubishi Denki Kabushiki Kaisha. Thyristor controlled power source for gradually decreasing loads. 4,617,453, Cl. 219-501.000.

Kumura, Haruyoshi: *See—*
Tanaka, Yoshikazu; Kumura, Haruyoshi; Abo, Keiju; Yamamuro, Sigeaki; and Hirano, Hiroyuki, 4,616,530, Cl. 74-851.000.

Kunitz, Friedrich-Wilhelm; and Schranz, Karl-Wilhelm, to Agfa Gevaert Aktiengesellschaft. Color photographic color coupler-containing recording material. 4,617,256, Cl. 430-557.000.

Kurakake, Mitsuo: *See—*
Kishi, Hajimu; Onuki, Tadayoshi; and Kurakake, Mitsuo, 4,617,640, Cl. 364-708.000.

Kuraray Co., Ltd.: *See—*
Maruyama, Hitoshi; Kajitani, Koichi; and Shiraishi, Makoto, 4,617,239, Cl. 428-452.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Hamada, Akira; Takahashi, Hisao; and Ohira, Keiichi, 4,617,231, Cl. 428-297.000.
Hatanaka, Masayoshi; and Takeuchi, Daizo, 4,617,268, Cl. 435-92.000.
Kawai, Yoshio; Kitagawa, Kiyoshi; Endo, Kazue; and Onodera, Chikau, 4,617,104, Cl. 204-301.000.

Kuromatsu, Kazuhiko: *See—*
Thai, Cao M.; Oguni, Takayuki; Kuromatsu, Kazuhiko; and Kato, Tsuguo, 4,617,330, Cl. 523-220.000.

Kuriyama, Takao: *See—*
Tanioka, Kenkichi; Shidara, Keiichi; Kuriyama, Takao; Takasaki, Yukio; Hirai, Tadaaki; Nonaka, Yasuhiko; and Inoue, Eisuke, 4,617,248, Cl. 430-95.000.

Kuroiwa, Hiroshi; and Oyama, Yoshishige, to Hitachi, Ltd. Method of air-fuel ratio control of internal combustion engines of automobiles. 4,616,621, Cl. 123-585.000.

Kuroki, Junsuke: *See—*
Sugasawa, Fukashi; Kuroki, Junsuke; and Akatsu, Yohsuke, 4,616,848, Cl. 280-707.000.

Kuroki, Kazuo, to Fuji Electric Co., Ltd. Inverters with reduced distributed inductance. 4,617,621, Cl. 363-71.000.

Kurosaki, Mutsuo, to Nifco, Inc. Lock device. 4,616,861, Cl. 292-6.000.

Kurtz, Robert J., to BioResearch Inc. Air leak detector and counter for drainage device. 4,617,020, Cl. 604-321.000.

Kuwabara, Hideki; Sudo, Yoshimi; and Kitagawa, Atusi, to Japan Styrene Paper Corporation. Prefoamed particles of crosslinked propylene-type resin and molded article prepared therefrom. 4,617,323, Cl. 521-60.000.

Kvita, Vratislav: *See—*
Mayer, Carl W.; Kvita, Vratislav; and Pfeifer, Josef, 4,617,151, Cl. 540-1.000.

Kwan Soon, Jung K. Table cooker with ventilator. 4,616,626, Cl. 126-39.00K.

Kyocera Corporation: *See—*
Nishiguchi, Yasuo; and Minami, Keijiro, 4,617,088, Cl. 156-656.000.

Kyomasu, Mikio; Araki, Toshiyuki; Fukunaga, Shinobu; and Shindo, Masahiro, to Ricoh Company, Ltd. Erasable FPLA. 4,617,649, Cl. 365-189.000.

Kyoso, Yasuo: *See—*
Akachi, Yoshiaki; Kyoso, Yasuo; and Matsumaru, Takeo, 4,617,543, Cl. 336-192.000.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Katsumata, Ryoichi; and Furuya, Akira, 4,617,267, Cl. 435-91.000.

Kysor Industrial Corporation: *See—*
Mehdi, Syed A.; Zieske, William E.; and Ward, David R., 4,616,484, Cl. 62-180.000.

La Telemecanique Electrique: *See—*
Martin, Gabriel R. J.; and Riquier, Jean-Marie J. G., 4,616,896, Cl. 339-17.00C.

Laclede Professional Products, Inc.: *See—*
Montgomery, Robert E., 4,617,190, Cl. 426-61.000.

Lacroix, Roger; and Argant, Yves. String support and neck device for stringed instrument. 4,616,550, Cl. 84-173.000.

Ladney, Michael, Jr.: *See—*
Loren, Norman S.; and Gordon, William E., 4,616,866, Cl. 293-120.000.

LaFiandra, Carlo; and Kreuzer, Justin, to Perkin-Elmer Corporation, The. Bistable aligner cartridge foot. 4,617,681, Cl. 378-34.000.

LaFrance Corporation: *See—*
Perfect, Alan J., 4,616,435, Cl. 40-6.000.

Lahoda, Erwin: *See—*
Schleich, Jean-Baptiste; Lahoda, Erwin; and Lickes, Jean-Paul, 4,616,464, Cl. 52-723.000.

Lai, Pepper Y., to Draper Corporation. Catch-cord drawing device for looms. 4,616,680, Cl. 139-304.000.

Laine, Antoine; and Senez, Claude, to Atochem. Polyurethane latex sizing agents for the paper industry and their method of manufacture. 4,617,341, Cl. 524-591.000.

Lake, Carole J.; Shanley, James J.; and Silverstein, Steven M., to AT&T Information Systems Inc. Interface testing of software systems. 4,617,663, Cl. 371-25.000.

Lambert, Robert E.: *See—*
Juell, Gaylord E.; and Lambert, Robert E., 4,617,616, Cl. 362-267.000.

Lamola, Angelo A.: *See—*
Blonder, Greg E.; Lamola, Angelo A.; and Lieberman, Robert A., 4,617,608, Cl. 361-291.000.

LaMontagne, Maurice P.: *See—*
Blumbergs, Peter; and LaMontagne, Maurice P., 4,617,394, Cl. 546-157.000.

Lan, Wei-Hsin. Music playing device. 4,616,549, Cl. 84-94.00R.

Landrum, Hollis T.: *See—*
Landrum, Van O.; and Landrum, Hollis T., 4,616,854, Cl. 283-74.000.

Landrum, Van O.; and Landrum, Hollis T. Insurance form indicia system. 4,616,854, Cl. 283-74.000.

Landstingens Inkopscentral Lic Ekonomisk Forening: *See—*
Bjornberg, Sten G.; Hjerten, Wilhelm E. S.; and Wadstrom, Torkel M., 4,617,326, Cl. 523-111.000.

Lang, Robert J., to Exxon Research and Engineering Co. Gasification process. 4,617,027, Cl. 48-210.000.

Lange, Gerd, to Glaser, Willy. Panel section interconnecting member and a shelf structure using a plurality of the panel section interconnecting members. 4,616,571, Cl. 108-111.000.

Lange, Lawrence K.: *See—*
Aichelmann, Frederick J., Jr.; and Lange, Lawrence K., 4,617,664, Cl. 371-38.000.

Langen, Hans: *See—*
Wolff, Erich; Langen, Hans; and Braden, Rudolf, 4,617,255, Cl. 430-553.000.

Langner, Carl G., to Shell Oil Company. Riser braking clamp apparatus. 4,616,707, Cl. 166-345.000.

Large, Jean F., to Charbonnages de France. Valve for the pneumatic distribution of fluidizable material. 4,616,426, Cl. 34-57.00A.

Larson, Eric H.: *See—*
Becker, Larry W.; and Larson, Eric H., 4,617,362, Cl. 526-209.000.
Larsson, Leif; and Ekdahl, Bengt, to AB Mataki; and Storalene AB. Non-woven fabric, a bituminous water-proofing membrane built up on it, and the use of the fabric as a carcass in such a membrane. 4,617,229, Cl. 428-284.000.
Larter, Stephen R.: *See—*
Senftle, Joseph T.; and Larter, Stephen R., 4,617,467, Cl. 250-461.100.
Latka, Henry C., to General Signal Corporation. System for controlling the diameter of a crystal in a crystal growing furnace. 4,617,173, Cl. 422-107.000.
Lau, Yue-Ying, to United States of America, Navy. Collective interaction klystron. 4,617,493, Cl. 315-5.000.
Laurence, Lynne: *See—*
Jean, Joseph A., Jr.; and Laurence, Lynne, 4,616,367, Cl. 2-452.000.
Laurent, Jean; and Fabre, Andre , to Institut Francais du Petrole. Device for anchoring a probe in a well, by opening mobile arms. 4,616,703, Cl. 166-66.400.
Lauro, Charles W.: *See—*
Quinlan, Robert L., Jr.; and Lauro, Charles W., 4,616,824, Cl. 272-86.000.
Lausch, Wolfram: *See—*
Amende, Welf; Lausch, Wolfram; and Zechmeister, Hartwin, 4,617,070, Cl. 148-152.000.
Lawrie, Ian J.: *See—*
Chopping, Geoffrey; Lawrie, Ian J.; and Maric, Milan Z., 4,617,659, Cl. 370-100.000.
Lawton Haygood Corporation: *See—*
Haygood, Lawton C., 4,616,627, Cl. 126-77.000.
LeaRonal, Inc.: *See—*
Nobel, Fred I.; Ostrow, Barnet D.; and Schram, David N., 4,617,097, Cl. 204-44.400.
Leavitt, George E.; and LoStracco, Felice, to Kidde, Inc. Photoelectric smoke detector with adjustable background signal. 4,616,928, Cl. 356-338.000.
Leboutet, Hubert P.; and Aucouturier, Jeanne J., to CGR-MEV. Electron gun for a linear accelerator and accelerating structure incorporating such a gun. 4,617,494, Cl. 315-5.410.
Leco Corporation: *See—*
Bonnard, John A., 4,616,938, Cl. 374-38.000.
Lederer, Gabor. Electric light fixture. 4,617,614, Cl. 362-212.000.
Lee, James M. Podded cleat horseshoe. 4,616,709, Cl. 168-13.000.
Lee, John W., Jr.: *See—*
Borror, Alan L.; Cincotta, Louis; and Lee, John W., Jr., 4,617,402, Cl. 548-455.000.
Lee, Jong J. Automatic fish hook. 4,616,439, Cl. 43-36.000.
Lee, Mei-Tsu: *See—*
Schwab, Gerhart; Lee, Mei-Tsu; and Bentley, James W., 4,617,099, Cl. 204-133.000.
Lee, Seung J. Process for producing blackboard crayon. 4,617,058, Cl. 106-19.000.
Lees, Michael J., to Ciba-Geigy. Scale inhibition. 4,617,129, Cl. 210-700.000.
Leger, Claude, to Dispovet. Protective slipper adaptable to different sizes. 4,616,428, Cl. 36-7.10R.
Legrand, Maurice: *See—*
Echevin, Michel; Piegay, Yves; and Legrand, Maurice, 4,616,842, Cl. 280-602.000.
Leir, Charles M., to Riker Laboratories, Inc. Process for the preparation of derivatives of piperidine. 4,617,396, Cl. 546-233.000.
Lemay, Marshall A.: *See—*
Bullock, Donald F.; Wilson, Austin F.; Lemay, Marshall A.; and Miles, David B., 4,617,514, Cl. 324-137.000.
Lemerre, Guy. Prefabricated constructions and their components. 4,616,452, Cl. 52-71.000.
Lemke, Gary, to ASV Corporation. Steering mechanism for all season vehicle. 4,616,724, Cl. 180-6.480.
Lengyel, Albin D. Method for protecting plant life from acidic atmospheric pollutants. 4,617,049, Cl. 71-88.000.
Lenz, Robert W.; and Behm, Dean T., to Dow Chemical Company, The. Thermotropic liquid crystalline polymers. 4,617,370, Cl. 528-191.000.
Lenzner, Phillip M. Plant support. 4,616,442, Cl. 47-45.000.
Leonard, Gary S., to Carrier Corporation. Diffuser wall control. 4,616,483, Cl. 62-115.000.
Leriche, Christian: *See—*
Augustin, Daniel; Leriche, Christian; and Poisson, Pierre, 4,617,354, Cl. 525-301.000.
Lerner, Boaz: *See—*
Barzuza, Yizhak; and Lerner, Boaz, 4,617,120, Cl. 210-409.000.
Leschke, Harald: *See—*
Sacco, Bruno; Tomforde, Johann; Paschke, Joachim; and Leschke, Harald, 4,616,869, Cl. 296-1.00S.
Lespinats, Christian; and Minet, Michel, to Valeo. Process for heating a substance, for purposes of vulcanization or polymerization. 4,617,439, Cl. 219-10.55M.
L'Etat Francais represente par le Delegue General pour l'Armement Bureau des Brevets et Inventions: *See—*
Montier, Patrick; Sauvestre, Jean-Claude; Bethmann, Karl W.; Bisping, Bernhard; and Wallow, Peter, 4,616,569, Cl. 102-517.000.
Letoquart, Bruno, to Thomson-CSF. Process for increasing the range and particularly the protection against jamming of an MLS landing system and means for performing this process. 4,617,569, Cl. 342-412.000.
Leuprecht, Helmut, to Rauscher & Co. Verbandstoff- und Wattefabriken. Absorbent surgical dressing, and process for manufacturing same. 4,617,021, Cl. 604-365.000.
Leutgob, Alois: *See—*
Lugscheider, Walter; Mullner, Paul; Schiffer, Wilhelm; and Leutgob, Alois, 4,617,671, Cl. 373-22.000.
Levenson, Corey H.: *See—*
Sheldon, Edward L., III; Levenson, Corey H.; Mullis, Kary B.; Rapoport, Henry; and Watson, Robert M., 4,617,261, Cl. 435-6.000.
Leveque, Jean-Luc M.; and Gras, Gilbert J., to L'Oreal. Process and apparatus for making a numerical determination of the color, or of a change in color, of an object. 4,616,933, Cl. 356-416.000.
Lever Brothers Company: *See—*
Robb, Ian D.; and Duggleby, Peter M., 4,617,139, Cl. 252-135.000.
Levine, Stephen N., to Motorola, Inc. Digital lock detector for a phase-locked loop. 4,617,520, Cl. 328-133.000.
Levitz, Steven E.: *See—*
Sheppard, Isaac, Jr.; Jewell, Everett; Levitz, Steven E.; and Taylor, Rudolph T., 4,616,453, Cl. 52-93.000.
Levy, Shlomo: *See—*
Elmaleh, David R.; Levy, Shlomo; Shiue, Chyng-Yann; and Wolf, Alfred P., 4,617,386, Cl. 536-122.000.
Lewis, Adam J.: *See—*
Schulte, Eric F.; and Lewis, Adam J., 4,616,403, Cl. 29-572.000.
Lewis, Duane J.; and McNeese, William H., to Vista Chemical Company. Production and recovery of alumina from vapor phase hydrolysis of aluminum trialkoxides. 4,617,183, Cl. 423-630.000.
Lewis, James L., to Bott, Arthur J., a part interest. Tow bar block and tow bar assembly. 4,616,970, Cl. 414-563.000.
Lewis, Roger N.: *See—*
Muenchow, John R.; Bock, Lawrence A.; and Lewis, Roger N., 4,617,324, Cl. 521-96.000.
Libbey, William J.: *See—*
Page, Matthew A.; Libbey, William J.; and Lundeen, Allan J., 4,617,352, Cl. 525-240.000.
Lickes, Jean-Paul: *See—*
Schleich, Jean-Baptiste; Lahoda, Erwin; and Lickes, Jean-Paul, 4,616,464, Cl. 52-723.000.
Lieberman, Robert A.: *See—*
Blonder, Greg E.; Lamola, Angelo A.; and Lieberman, Robert A., 4,617,608, Cl. 361-291.000.
Liebig, Winfried: *See—*
Siekmann, Helmut E.; Bassler, Jurgen; and Liebig, Winfried, 4,617,130, Cl. 210-748.000.
Lifecare Services, Inc.: *See—*
Chu, Raymond D.; Rubner, Anthony C.; and Fellinger, Michael W., 4,617,637, Cl. 364-505.000.
Lifecodes Corp.: *See—*
Tomblin, Graham J.; Wexler, Karen B.; Ford, John P.; and Fischer, Stuart G., 4,617,102, Cl. 204-299.00R.
Light, William G., to Allied Corporation. Production of low alcoholic content beverages. 4,617,127, Cl. 210-651.000.
Lill, Graham D., to U.S. Philips Corporation. High-speed switched oscillator. 4,617,534, Cl. 331-117.00R.
Linco Holland Engineering B.V.: *See—*
Tieleman, Rudolf J., 4,616,380, Cl. 17-11.000.
Lindquist, Julius A.: *See—*
Saferstein, Lowell; Lindquist, Julius A.; and Wolf, Stephen J., 4,616,644, Cl. 128-156.000.
Lindroos, Jarl: *See—*
Stout, Michael E.; Peacock, Bobbie; and Lindroos, Jarl, 4,617,112, Cl. 209-11.000.
Lingl Corporation: *See—*
Lingl, Hans, Jr., 4,616,995, Cl. 432-9.000.
Lingl, Hans, Jr., to Lingl Corporation. Tunnel dryer for bricks and like objects. 4,616,995, Cl. 432-9.000.
Lingner & Fischer GmbH: *See—*
Flier, Gustav, 4,616,768, Cl. 222-92.000.
Lings, Barry W.; and Nicholson, John H., to Rolls-Royce plc. Cooled vane or blade for a gas turbine engine. 4,616,976, Cl. 416-97.00R.
Link, Edwin A., to RTE Corporation. Submersible primary circuit breaker. 4,617,545, Cl. 337-74.000.
Lio, Kuei M. Concealed pull handle. 4,616,379, Cl. 16-115.000.
Lippel, Bernard, to Quanticon Inc. Compatible color television with regenerable signals. 4,617,597, Cl. 358-310.000.
Lippert, Bernhard; and Raudaschl, Gabriele, to Degussa Aktiengesellschaft. Process for the production of pure cis-platinum-(II)-idiammine dichloride. 4,617,410, Cl. 556-137.000.
Lisec, Peter. Apparatus for removing strips from compartments. 4,616,746, Cl. 198-463.300.
Lister, Robert W. Soil perforator. 4,616,714, Cl. 172-21.000.
Litton Systems, Inc.: *See—*
Martin, Graham J., 4,616,930, Cl. 356-350.000.
Liu, Kuo-Ching, to Quantronix Corporation. Frequency doubling a laser beam by using intracavity type II phase matching. 4,617,666, Cl. 372-22.000.
Liu, Sophia Y., to Stauffer Chemical Company. Biocidal agents for use in plastics, polymers and cellulosic materials. 4,617,328, Cl. 523-122.000.
Liu, Yi-Tsung: *See—*
Girijavallabhan, Viyyoor M.; Ganguly, Ashit K.; Patel, Naginbhai; and Liu, Yi-Tsung, 4,617,300, Cl. 514-192.000.
Liu, Yung S.: *See—*
Cole, Herbert S., Jr.; Liu, Yung S.; and Philipp, Herbert R., 4,617,085, Cl. 156-643.000.

Liwak, Susan M.: *See—*
Weese, Richard H.; Crook, Evan H.; and Liwak, Susan M., 4,617,329, Cl. 523-201.000.
Lloyd, Stephen R. Sleep posture monitor and alarm system. 4,617,525, Cl. 340-573.000.
Lloyd, William J., to Hewlett-Packard Company. Inversely processed resistance heater. 4,616,408, Cl. 29-611.000.
Lockheed Corporation: *See—*
Cairns, James L., 4,616,900, Cl. 350-96.200.
Gray, Robert M., 4,616,499, Cl. 72-56.000.
LOF Plastics Inc.: *See—*
Ives, Albert G., 4,617,209, Cl. 428-31.000.
Lok, Kar P.: *See—*
Ober, Christopher K.; and Lok, Kar P., 4,617,249, Cl. 430-137.000.
Lokar, Raymond S.: *See—*
Richards, Tom; and Lokar, Raymond S., 4,617,456, Cl. 219-523.000.
L'Oreal: *See—*
Leveque, Jean-Luc M.; and Gras, Gilbert J., 4,616,933, Cl. 356-416.000.
Loren, Norman S.; and Gordon, William E., to Ladney, Michael, Jr. Vehicle bumper. 4,616,866, Cl. 293-120.000.
Lorenzen, Heinz-Christen; Heitmann, Uwe; and Steiniger, Wolfgang, to Hauni-Werke Korber & Co. KG. Method and apparatus for forming a homogeneous mass of comminuted smokable material. 4,616,663, Cl. 131-109.300.
Losenno, Luigi G. Hair treatment solution collector. 4,616,666, Cl. 132-9.000.
LoStracco, Felice: *See—*
Leavitt, George E.; and LoStracco, Felice, 4,616,928, Cl. 356-338.000.
Louie, Robert E.: *See—*
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Lovegrove, Peter C., to United Kingdom Atomic Energy Authority. Electrophoretic separator. 4,617,103, Cl. 204-300.00R.
Lowel-Light Manufacturing, Inc.: *See—*
Lowell, Ross; Seligman, Marvin; and Calamai, Edward, 4,616,384, Cl. 24-335.000.
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Luetzow, Edwin J., to Tel Tec Inc. Flexible wire cable and process of making same. 4,616,717, Cl. 174-117.00F.
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Lukenbach, Elvin R.; and Tenore, Richard R., to Johnson & Johnson Baby Products Company. Process for the preparation of phosphate surfactants. 4,617,414, Cl. 558-87.000.
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Page, Matthew A.; Libbey, William J.; and Lundeen, Allan J., 4,617,352, Cl. 525-240.000.
Luschnig, Franz: *See—*
Freisinger, Henry; Luschnig, Franz; Stritzl, Karl; and Zotter, Johann, 4,616,843, Cl. 280-618.000.
Luthra, Krishan L., to General Electric Company. High pressure sodium lamp having improved pressure stability. 4,617,492, Cl. 313-630.000.
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Lyons, James E., to Sun Refining and Marketing Company. Ruthenium-cobalt carbonyl catalysts for the dealkoxyhydroxymethylation of aldehyde acetals to form glycol ethers. 4,617,287, Cl. 502-174.000.
Lyons, Shirley. Wrap. 4,616,365, Cl. 2-69.000.
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Stout, Michael E.; Peacock, Bobbie; and Lindroos, Jarl, 4,617,112, Cl. 209-11.000.
M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Amende, Welf; Lausch, Wolfram; and Zechmeister, Hartwin, 4,617,070, Cl. 148-152.000.
Knop, Klaus; and Heinrich, Peter, 4,617,051, Cl. 75-91.000.
M.A.N. Nutzfahrzeuge GmbH: *See—*
Kubis, Heribert; and Winter, Josef, 4,616,603, Cl. 123-41.840.
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Wells, Thomas A.; and Petterson, William C., 4,617,109, Cl. 208-130.000.
Ma, Thomas T., to Ford Motor Company. Internal combustion engine and cam drive mechanism therefor. 4,616,606, Cl. 123-90.170.
Maatela, Pentti I. Coupling. 4,616,951, Cl. 403-290.000.
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MacCracken, Calvin D. Superdensity assembly method and system for plastic heat exchanger resists large buoyancy forces and provides fast melt down in phase change thermal storage. 4,616,390, Cl. 29-157.30R.
MacDonald, Lindsay W., to Crosfield Electronics Limited. Video retouching system. 4,617,592, Cl. 358-80.000.
MacDonald, Russell J., to Ionics, Incorporated. Synthesis of highly cross-linked cation-exchange polymers from an aqueous solution. 4,617,321, Cl. 521-38.000.
Mackle, Michael T., to Wormald International, Limited. Security lock assembly. 4,616,865, Cl. 292-341.160.
Macksey, Harry M.; and Hudgens, Rick D., to Texas Instruments Incorporated. Process for fabricating a double recess channel field effect transistor. 4,616,400, Cl. 29-571.000.
Maeda, Kazuhiko; and Kawada, Akira, to Central Glass Company, Limited. Fluorine-containing resin composition for optical use. 4,617,350, Cl. 525-153.000.
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Nezu, Yasutada; Tamura, Yutaka; Mizuno, Yuuzi; Iwamoto, Hiroshi; Yokota, Akihiro; and Maeda, Kiyoshi, 4,617,578, Cl. 346-108.000.
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Yoshida, Tadashi; Shimizu, Katsuichi; Arimoto, Shinobu; Maeshima, Katsuyoshi; Nagashima, Nao; and Watanabe, Asao, 4,617,596, Cl. 358-280.000.
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Magnussen, Haakon T., Jr.; and Ruskewicz, Stephen J., to Rainin Instrument Co., Inc. Replaceable tip assembly for pipette. 4,616,514, Cl. 73-864.140.
Mahler, Darrell. Liquid-dispensing container assembly. 4,616,759, Cl. 215-228.000.
Mahnig, Fritz: *See—*
Hornung, Klaus; Alt, Anton; Schulte, Gunter; and Mahnig, Fritz, 4,617,069, Cl. 148-138.000.
Makio, Tatsumi; Hayakawa, Kazumasa; and Sakaguchi, Genta, to Minolta Camera Kabushiki Kaisha. Paper sheet feeding arrangement. 4,616,819, Cl. 271-122.000.
Malabre, Christian: *See—*
Soum, Jacques; and Malabre, Christian, 4,616,388, Cl. 29-149.50S
Malinski, Richard F.; and Sikorcin, John, to Vapor Corporation. Valve actuator with continuous manual override. 4,616,528, Cl. 74-626.000.
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Dreibelbis, John A., 4,617,060, Cl. 106-193.00R.
Mamodaly, Narguise: *See—*
Bert, Alain; and Mamodaly, Narguise, 4,617,528, Cl. 331-56.000.
Manabe, Tsuneo; Kobayashi, Shigeyoshi; and Kijimuta, Hitoshi, to Asahi Glass Company Ltd. Calcium phosphate type crystallizable glass. 4,617,279, Cl. 501-10.000.
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Fergason, James L., 4,616,903, Cl. 350-334.000.
Mancini, George M.; and Huber, Rudolph A., to Matth. Hohner AG. Improviser circuit and technique for electronic musical instrument. 4,616,547, Cl. 84-1.030.
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Mangulis, Visvaldis; and Schiff, Leonard N., to RCA Corporation. Synchronizing system for spread spectrum transmissions between small earth stations by satellite via an intermediate hop to a large earth station. 4,617,674, Cl. 375-1.000.
Mann, Philip, to Tuffy Books, Inc. Book structure. 4,616,851, Cl. 281-15.00R.
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Amrhein, Reinhard, 4,616,675, Cl. 137-625.650.
Manresa, Inc.: *See—*
Vaillancourt, Vincent L., 4,617,012, Cl. 604-29.000.
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Anderson, Russell W.; and Held, Michael J., 4,616,965, Cl. 408-204.000.
Manuli Autoadesivi SpA: *See—*
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Marcandalli, Ulderico, to Rockwell-Rimoldi S.p.A. Device providing for three sewing machine needle strokes. 4,616,585, Cl. 112-221.000.
Marchal, Daniel: *See—*
Courtoy, Jean-Francois; and Marchal, Daniel, 4,617,222, Cl. 428-142.000.
Marei, Abdel H., to American Cyanamid Company. Non-irritating pyrethroid formulations in vegetable oils and tall oils. 4,617,318, Cl. 514-520.000.
Mareydt, Ray G. Carrier rack and stanchion. 4,616,772, Cl. 224-326.000.

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Chopping, Geoffrey; Lawrie, Ian J.; and Maric, Milan Z., 4,617,659, Cl. 370-100.000.

Marietta, Charles F.; and Holley, Kenneth, to Nordson Corporation. Spray gun carriage assembly having inertial damping and a variable stroke. 4,616,782, Cl. 239-752.000.

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Nikolov, Ivan D., deceased; Dimova, Vassilka P., heir; Dimov, Dobromir I., heir; Dimov, Petar I., heir; Marinov, Marin I.; Peytchev, Ivan M.; Rashev, Tzolo V.; and Tchorbov, Iliya G., 4,616,808, Cl. 266-207.000.

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Christophersen, John A.; Marquardt, Fred J.; and Zipperian, Donald E., 4,617,113, Cl. 209-170.000.

Marsh, Richard L.: *See—*
Wetzel, Robert E.; and Marsh, Richard L., 4,617,075, Cl. 156-137.000.

Marshall, Robert M., to Allied Corporation. Additives to polyester tire yarn overfinish to reduce dip penetration. 4,617,236, Cl. 428-391.000.

Martin, Gabriel R. J.; and Riquier, Jean-Marie J. G., to La Telemecanique Electrique. Connecting terminal for printed circuit board. 4,616,896, Cl. 339-17.00C.

Martin, Graham J., to Litton Systems, Inc. Optically biased twin ring laser gyroscope. 4,616,930, Cl. 356-350.000.

Martin, Jeffrey A.; and Pomeroy, Philip S., to Kimberly-Clark Corporation. Surgical drape for caesarean section. 4,616,642, Cl. 128-132.00D.

Martin, Joel L., to Phillips Petroleum Company. Process and catalyst for olefin polymerization. 4,617,361, Cl. 526-114.000.

Martin Marietta Corporation: *See—*
Chen, Wenpeng; and Byer, Norman E., 4,617,532, Cl. 331-107.00R.

Martin, Michael: *See—*
Pedersen, Vernon G.; and Martin, Michael, 4,616,645, Cl. 128-204.260.

Martin, Michael A.: *See—*
Johns, Allan T.; and Martin, Michael A., 4,617,636, Cl. 364-482.000.

Martin, Roland, to Charmilles Technologies, S.A. EDM apparatus pulse generator. 4,617,443, Cl. 219-69.00C.

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Hoppe, Udo; Seib, Karl; Naegele, Paul; and Martin, Roland, 4,617,390, Cl. 544-197.000.

Martin, Tellis A.; and Dolak, Terence M., to Mead Johnson & Company. Angiotensin-converting enzyme inhibiting dipeptide derivatives. 4,617,291, Cl. 514-19.000.

Marton, Miksa. Suction housing for vacuum sanding devices. 4,616,449, Cl. 51-273.000.

Maru, Hideki: *See—*
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Kishino, Takao; Marushima, Ikuo; and Kanetsuna, Nobumitsu, 4,617,491, Cl. 313-497.000.

Maruyama, Hitoshi; Kajitani, Koichi; and Shiraishi, Makoto, to Kuraray Co., Ltd. Paper coating agent. 4,617,239, Cl. 428-452.000.

Marx, Matthias: *See—*
Horn, Peter; Baumann, Edwin; Marx, Matthias; and Gerarts, Peter, 4,617,225, Cl. 428-215.000.

Masamoto, Yukimitsu: *See—*
Satoh, Toshio; Miyataka, Hideki; Masamoto, Yukimitsu; Asai, Takashi; Hasegawa, Kenji; and Kakegawa, Hisao, 4,617,292, Cl. 514-27.000.

Maskalick, David G.; and Anderson, Marie T., to Eli Lilly and Company. Process for recovering glucagon from pancreas glands. 4,617,376, Cl. 530-308.000.

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DiPietro, Matthew; and Maslanka, Daniel C., 4,616,926, Cl. 355-45.000.

Massey, Richard T.: *See—*
Kramer, Daniel P.; and Massey, Richard T., 4,617,044, Cl. 65-49.000.

Masuda, Ikuro: *See—*
Kuboki, Shigeo; Maejima, Hideo; and Masuda, Ikuro, 4,617,648, Cl. 365-189.000.

Masuda, Shinji, to NEC Corporation. Amplifier circuit free from leakage between input and output ports. 4,617,481, Cl. 307-491.000.

Mathers, Roy, to Mixalloy Limited. Production of metal strip. 4,617,054, Cl. 75-246.000.

Matheson, Ronald R.; and Hucul, Daniel E., to Auto/Con. Fluid supply surge control system. 4,616,978, Cl. 417-2.000.

Mathias, Jean M.: *See—*
Kersten, Jean; and Mathias, Jean M., 4,616,760, Cl. 215-232.000.

Mathieu, Bernd, to Fresenius, Eduard. Blood exchange apparatus. 4,617,119, Cl. 210-321.300.

Matrone, John L., to Fairchild Camera and Instrument Corp. Robotic hand and method for manipulating printed circuit boards. 4,616,971, Cl. 414-730.000.

Matson, Gary R.; Pottle, Winston G.; and Soucy, Francis L., to Eastman Kodak Company. Reader-printer apparatus with an improved viewing and print mirror assembly. 4,616,921, Cl. 355-5.000.

Matsuda, Kohei, to NEC Corporation. Complementary type MOS field-effect transistor circuit provided with a gate protection structure of small time constant. 4,617,482, Cl. 307-579.000.

Matsuda, Noriaki; and Shinkai, Etsuro, to Toa Medical Electronics Co., Ltd. Reagent for blood analysis. 4,617,275, Cl. 436-10.000.

Matsui, Isamu; Uchida, Hiroshi; Nakanishi, Kazuo; and Shimano, Akira, to Murata Kikai Kabushiki Kaisha. Yarn end readying device in winder. 4,616,789, Cl. 242-35.50R.

Matsui, Minoru, to Nippon Acchakutansi Seizo Kabushiki Kaisha. Wire length varying device in combination with apparatus for making electrical harnesses. 4,616,396, Cl. 29-566.100.

Matsumaru, Takeo: *See—*
Akachi, Yoshiaki; Kyoso, Yasuo; and Matsumaru, Takeo, 4,617,543, Cl. 336-192.000.

Matsumoto, Ikuo: *See—*
Nakamura, Takeshi; and Matsumoto, Ikuo, 4,617,488, Cl. 310-321.000.

Matsumoto, Shinzo: *See—*
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Matsumoto, Yoshikane; and Hiki, Toshio, to Hitachi Koki Company, Limited. Apparatus for preventing the rise of an ink ribbon. 4,616,943, Cl. 400-247.000.

Matsumoto, Yoshiyuki; and Maru, Hideki, to Honda Giken Kogyo Kabushiki Kaisha. Trailing link beam suspension. 4,616,849, Cl. 280-724.000.

Matsunaga, Hiroshi: *See—*
Tokunaga, Ichiro; Matsunaga, Hiroshi; and Shimojima, Yoji, 4,617,460, Cl. 250-227.000.

Matsunaga, Kuniyoshi: *See—*
Yamada, Hideaki; Otsuji, Shogo; Isobe, Kimiyasu; Matsunaga, Kuniyoshi; and Inukai, Tadahiko, 4,617,263, Cl. 435-25.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Hikino, Tadashi; and Turuda, Kunihiro, 4,616,993, Cl. 431-41.000.
Hosaka, Tomiharu; Kishimoto, Yoshio; and Shimotsuma, Wataru, 4,617,356, Cl. 525-429.000.
Miura, Kengi; and Iida, Norikazu, 4,617,611, Cl. 361-433.000.
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Tsuruoka, Keiichirou; and Minohara, Ryo, 4,617,598, Cl. 360-10.300.

Matsushita, Takashi, to Sanden Corporation. Spring coupling for an electromagnetic clutch. 4,616,742, Cl. 192-84.00C.

Matsuura, Kazuo: *See—*
Furuya, Kunitaka; Inagaki, Hiromi; Koga, Kiyoshi; Yorita, Masaru; Fukatsu, Tsunehiko; and Matsuura, Kazuo, 4,616,846, Cl. 280-673.000.

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Mattel, Inc.: *See—*
Klock, Anita H.; and Chodak, Jan B., 4,617,643, Cl. 364-900.000.

Matth. Hohner AG: *See—*
Mancini, George M.; and Huber, Rudolph A., 4,616,547, Cl. 84-1.030.

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Reichl, Bernhard; Maurath, Rudolf; Koch, Dieter; and Hametner, Gerhard, 4,616,841, Cl. 280-432.000.

Maxim, Peter E.; and Veltri, Robert W., to CooperBiomedical, Inc. Assaying for circulating immune complexes with labeled protein A. 4,617,262, Cl. 435-7.000.

Mayer, Carl W.; Kvita, Vratislav; and Pfeifer, Josef, to Ciba-Geigy Corporation. 2- or 2,3-substituted 5,6,11,12-tetrathiotetracene and 5,6,11,12-tetraselenotetracene. 4,617,151, Cl. 540-1.000.

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Hattori, Toshihiko; Akagi, Yuji; and Kohara, Hideo, 4,616,985, Cl. 418-173.000.
Kanai, Seita; and Hirochika, Takashi, 4,616,847, Cl. 280-707.000.
Ogawa, Yutaka; Ogasawara, Takayuki; and Hanzawa, Shigeru, 4,616,611, Cl. 123-270.000.
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McAllister, Jack D., to United States of America, Air Force. Direct lift command blending. 4,617,633, Cl. 364-434.000.

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Davis, Edgar A.; Dexter, Rose M.; and McCarthy, John D., 4,616,458, Cl. 52-230.000.

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McCreadie, John B., to Parmelee Industries, Inc. Molded fiber disposable face mask having enhanced nose and chin filter-seals. 4,616,647, Cl. 128-206.190.

McDaniel, Donald E., to Joy Manufacturing Company. Suspension system for operator's compartment. 4,616,725, Cl. 180-89.130.

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Grote, Michael G., 4,616,699, Cl. 165-104.260.
McFalls, Bob L.; and Tighe, William R., to Ferro Manufacturing Corporation. Adjustable seat construction. 4,616,875, Cl. 297-325.000.
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McGarry, Richard A.: *See*—
Green, David T.; McGarry, Richard A.; and Smith, Graham, 4,616,650, Cl. 128-325.000.
McGough, Gerald B.: *See*—
Gala, Babulal V.; and McGough, Gerald B., 4,617,428, Cl. 179-100.00C.
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Kruse, Lyle W.; and McKnight, Richard P., 4,617,167, Cl. 376-153.000.
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Rademacher, Thomas P., 4,616,369, Cl. 4-497.000.
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Hiscock, Donald F.; Jacomet, Joe A.; and Carter, Deborah H., 4,617,223, Cl. 428-211.000.
Schwab, Gerhart; Lee, Mei-Tsu; and Bentley, James W., 4,617,099, Cl. 204-133.000.
Mead Johnson & Company: *See*—
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Van Woensel, Dirk; and Van Woensel, Ilja, 4,616,382, Cl. 17-73.000.
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Schmid, Hans, 4,616,386, Cl. 29-33.00M.
Mehdi, Syed A.; Zieske, William E.; and Ward, David R., to Kysor Industrial Corporation. Vehicle refrigerant heating and cooling system. 4,616,484, Cl. 62-180.000.
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Menjo, Hiroshi; Sakamoto, Nobuo; and Watanabe, Yoshikazu, to Konishiroku Photo Industry Co., Ltd. Silver halide photographic material. 4,617,258, Cl. 430-566.000.
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Menzel, Stanley W. O., to Rib Loc Hong Kong Limited. Helically-formed pipe winding machine. 4,616,495, Cl. 72-49.000.
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Ashton, Wallace; Walton, Edward; and Tolman, Richard L., 4,617,304, Cl. 514-261.000.
Christensen, Burton G.; Cama, Lovji D.; and Schmitt, Susan M., 4,617,152, Cl. 540-200.000.
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Kugele, Thomas G.; Mesch, Keith A.; and Wursthorn, Karl R., 4,617,334, Cl. 524-177.000.
Messinger, Robert; and Tobias, Samuel J., to Hayward Pool Products, Inc. Housing assembly with removable jacked cover. 4,617,117, Cl. 210-198.100.
Methode Electronics, Inc.: *See*—
DuRocher, Daniel J., 4,617,437, Cl. 200-153.00P.
Mewes, Heinz; Nachtigall, Wilhelm; Wienand, Michael, deceased; by Wienand, Anneliese, legal representative; by Wienand, Hans-Jurg W., heir; by Wienand, Michael, heir; by Wienand, Rudolf J., heir; by Wienand, Karl F., heir; and by Wienand, Elisabeth H. M., heir, to Dynamit Nobel Aktiengesellschaft. Apparatus for the incorporation of glass fibers into thermoplastic synthetic resins. 4,616,989, Cl. 425-203.000.
Meyer, Alfred: *See*—
Tomm, Dagwin; Kolb, Dieter; Gehrig, Siegmund; and Meyer, Alfred, 4,616,744, Cl. 192-109.00R.
Mich, Thomas F.; and Domagala, John M., to Warner-Lambert Company. 7-substituted amino-1-aryl-6,8-difluoro-1,4-dihydro-4-oxo-3-quinolinecarboxylic acids and derivatives thereof as antibacterial agents. 4,617,308, Cl. 514-312.000.
Michaud-Soret, Jean A., to Society Nationale Industrielle Aerospatiale. Beam or other element of great length of a composite material polymerized under heat and pressure. 4,617,217, Cl. 428-71.000.
Michel, Jean: *See*—
Braun, Camille; Danroc, Joel; Francois, Bernard; and Michel, Jean, 4,617,158, Cl. 264-0.500.
Microlite, Inc.: *See*—
Mental, Richard W., 4,617,195, Cl. 427-66.000.
Mikami, Seiiti: *See*—
Suzuki, Toshifumi; Kawano, Toshio; Setoguchi, Ryoichi; Ishida, Toshio; and Mikami, Seiiti, 4,616,411, Cl. 29-822.000.
Miles, David B.: *See*—
Bullock, Donald F.; Wilson, Austin F.; Lemay, Marshall A.; and Miles, David B., 4,617,514, Cl. 324-137.000.
Miles Laboratories, Inc.: *See*—
Dobkin, Milton B.; and Louie, Robert E., 4,617,379, Cl. 530-388.000.
Miller, Lloyd L. Method of molding a dental shade sample. 4,617,159, Cl. 264-16.000.
Miller, Robert N., to Air Products and Chemicals, Inc. Coal liquefaction process using pretreatment with a binary solvent mixture. 4,617,105, Cl. 208-412.000.
Miller, William J.: *See*—
McAleer, William J.; and Miller, William J., 4,617,260, Cl. 435-5.000.
Millet, Jean-Claude; and Reynaud, Jean-Louis, to Imaje S.A. Ink-jet print head assembly. 4,617,574, Cl. 346-75.000.
Milliken Research Corporation: *See*—
King, Herbert R., 4,616,794, Cl. 248-67.500.
Milliman, Keith, to Coleman Company, Inc., The. Pressure-regulated gas gun. 4,616,622, Cl. 124-73.000.
Millroy, John P. Fishing lure. 4,616,440, Cl. 43-42.120.
Mina Manufacturing, Inc.: *See*—
Cramer, Mina M., 4,616,797, Cl. 248-230.000.
Minami, Keijiro: *See*—
Nishiguchi, Yasuo; and Minami, Keijiro, 4,617,088, Cl. 156-656.000.
Minato, Ichiro: *See*—
Nasu, Kohji; and Minato, Ichiro, 4,617,349, Cl. 525-123.000.
Minck, Klaus-Otto: *See*—
Bottcher, Henning; Gottschlich, Rudolf; Hausberg, Hans-Heinrich; Seyfried, Christoph; and Minck, Klaus-Otto, 4,617,309, Cl. 514-339.000.
Minemoto, Isamu: *See*—
Sakai, Takahiro; and Minemoto, Isamu, 4,616,532, Cl. 74-869.000.
Minet, Michel: *See*—
Lespinats, Christian; and Minet, Michel, 4,617,439, Cl. 219-10.55M.
Minigrip, Inc.: *See*—
Christoff, Paul B., 4,617,683, Cl. 383-63.000.
Minnesota Mining and Manufacturing Company: *See*—
Merry, Richard P., 4,617,176, Cl. 422-179.000.
Sobieski, James F.; and Muehlhausen, Robert A., 4,616,922, Cl. 355-14.00R.
Minohara, Ryo: *See*—
Tsuruoka, Keiichirou; and Minohara, Ryo, 4,617,598, Cl. 360-10.300.
Minolta Camera Kabushiki Kaisha: *See*—
Makio, Tatsumi; Hayakawa, Kazumasa; and Sakaguchi, Genta, 4,616,819, Cl. 271-122.000.
Saijo, Takao; Saito, Takanori; Kamimura, Kuniaki; and Fujita, Masafumi, 4,616,925, Cl. 355-44.000.
Minor, John M. Floatation, splashless canoe motor mount. 4,616,591, Cl. 114-347.000.
Miranti, Joseph P., Jr.; Oliver, Larry R.; and Johnson, Clyde O., to Dayco Corporation. Belt construction for a continuously variable

transmission, transverse belt element therefor and methods of making the same. 4,617,007, Cl. 474-201.000.
Mishina, Hitoshi: *See*—
Okuyama, Shinichi; Mishina, Hitoshi; Furuse, Kazumaro; and Murotani, Isao, 4,617,187, Cl. 424-94.000.
Misu, Hiroshi: *See*—
Nakakita, Eiji; Koike, Akinobu; Sekiya, Toshiyuki; Misu, Hiroshi; and Kita, Nobuyuki, 4,617,250, Cl. 430-175.000.
Mita Kogyo Kabushiki Kaisha: *See*—
Kimura, Hiroshi; Hisajima, Masahiko; Shibata, Kiyoshi; and Morimoto, Kiyoshi, 4,616,924, Cl. 355-15.000.
Mitchell, J. Edwin: *See*—
Tarbutton, Victor F.; Mitchell, J. Edwin; and Blumenkranz, Robert M., 4,617,522, Cl. 330-149.000.
Mitry, Mourad T.: *See*—
Walker, James L.; and Mitry, Mourad T., 4,617,343, Cl. 524-817.000.
Mitsubishi Denki K.K.: *See*—
Shimizu, Yutaka, 4,617,635, Cl. 364-474.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Ishii, Toshiaki, 4,616,733, Cl. 187-29.00R.
Izumida, Kiichiro; and Kasai, Ritaroh, 4,617,634, Cl. 364-455.000.
Katou, Kazuo; Mizugami, Susumu; Tabuchi, Mamoru; Nakamura, Masayuki; Kobayashi, Toshiyuki; and Ritoh, Naotake, 4,616,545, Cl. 83-558.000.
Kotera, Yoshikazu, 4,616,494, Cl. 72-8.000.
Kumon, Seiichi, 4,617,453, Cl. 219-501.000.
Morishita, Mitsuharu; and Kouge, Shinichi, 4,617,626, Cl. 364-424.000.
Murata, Mitsuru; Kobayashi, Toyohiro; Mochizuki, Shoji; and Kawashima, Masamichi, 4,616,946, Cl. 400-704.000.
Mutoh, Norio, 4,617,568, Cl. 342-160.000.
Okamoto, Kiyohide; and Okita, Ryosuke, 4,616,740, Cl. 192-21.500.
Takahashi, Kenzo; Kumazaki, Nobuo; Yokoya, Hisao; Nakamura, Hironobu; and Kachi, Tadakatsu, 4,616,695, Cl. 165-54.000.
Tamaki, Akinobu; Kimura, Ken; Kawakami, Takeshi; and Irie, Masao, 4,616,407, Cl. 29-596.000.
Mitsubishi Gas Chemical Company, Inc.: *See*—
Sonoda, Nobuharu, 4,617,346, Cl. 525-68.000.
Mitsubishi Kinzoku Kabushiki Kaisha: *See*—
Ushijima, Hiroyuki; Shimomura, Hiroshi; and Nakayama, Masaaki, 4,616,962, Cl. 407-113.000.
Mitsubishi Paper Mills, Ltd.: *See*—
Miyauchi, Masahiro; and Higuchi, Masahiro, 4,617,582, Cl. 346-208.000.
Mitsubishi Petrochemical Company, Limited: *See*—
Matsuura, Mitsuyuki; Fujita, Takashi; and Sakamoto, Yoshio, 4,617,284, Cl. 502-111.000.
Oonishi, Akiyoshi; Doi, Shuhei; and Shimada, Takeo, 4,617,365, Cl. 526-265.000.
Yano, Kazunori; Goto, Teruhisa; and Abe, Katsuhiro, 4,617,372, Cl. 528-216.000.
Mitsui Toatsu Chemicals, Incorporated: *See*—
Ueki, Toru; Fukuda, Yoshiaki; Usami, Katsuyuki; and Kanasaki, Kazuharu, 4,617,207, Cl. 428-1.000.
Watanabe, Katsushi; Kageyama, Takafumi; Kano, Taisaku; Hirai, Koichi; and Ichihara, Yoshinobu, 4,617,367, Cl. 526-273.000.
Miura, Hirohisa; Satou, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, to Toyota Jidosha Kabushiki Kaisha. Metal cored ceramic surfaced fine powder material and apparatus and method for making it. 4,617,055, Cl. 75-251.000.
Miura, Kazuhiko: *See*—
Ootsuka, Yoshinori; Hattori, Tadashi; Ozaki, Tadashi; and Miura, Kazuhiko, 4,616,502, Cl. 73-35.000.
Miura, Kengi; and Iida, Norikazu, to Matsushita Electric Industrial Co., Ltd. Electrolytic capacitor. 4,617,611, Cl. 361-433.000.
Miwa, Yoshiyuki, to Kabushiki Kaisha Toshiba. Rice cooker. 4,617,452, Cl. 219-441.000.
Mixalloy Limited: *See*—
Mathers, Roy, 4,617,054, Cl. 75-246.000.
Miyahara, Junji: *See*—
Shiraishi, Hisashi; Kato, Hisatoyo; and Miyahara, Junji, 4,617,468, Cl. 250-484.100.
Miyakawa, Akira, to Canon Kabushiki Kaisha. Apparatus for recording on different types of mediums. 4,617,580, Cl. 346-136.000.
Miyamoto, Shoji: *See*—
Yasunobu, Seiji; Miyamoto, Shoji; and Ihara, Hirokazu, 4,617,627, Cl. 364-426.000.
Miyano, Seiji; Sumoto, Kunihiro; Morita, Minoru; and Sato, Fumio, to Suntory Ltd. 8-substituted pyrrolizidine and quaternary ammonium salts thereof. 4,617,401, Cl. 548-453.000.
Miyataka, Hideki: *See*—
Satoh, Toshio; Miyataka, Hideki; Masamoto, Yukimitsu; Asai, Takashi; Hasegawa, Kenji; and Kakegawa, Hisao, 4,617,292, Cl. 514-27.000.
Miyauchi, Masahiro; and Higuchi, Masahiro, to Mitsubishi Paper Mills, Ltd. Heat-sensitive recording sheet. 4,617,582, Cl. 346-208.000.
Miyauchi, Otohiko; Ohkawachi, Michihiro; and Yotsuyanagi, Junji, to Showa Denko Kabushiki Kaisha. Can-like container. 4,616,766, Cl. 220-450.000.
Miyauchi, Tetsuro; and Niino, Koji, to S. M. C. Co., Ltd. Miniature D.C. motor with improved terminal plate and brushes. 4,617,486, Cl. 310-233.000.
Miyoshi, Takahito: *See*—
Yamaguchi, Nobutaka; Utumi, Masahiro; Fujiyama, Masaaki; and Miyoshi, Takahito, 4,617,226, Cl. 428-216.000.
Mizogui, Toyokazu: *See*—
Someya, Hiromi; Aihara, Yoshihiko; Suzuki, Nobuyuki; and Mizogui, Toyokazu, 4,616,916, Cl. 354-442.000.
Mizugami, Susumu: *See*—
Katou, Kazuo; Mizugami, Susumu; Tabuchi, Mamoru; Nakamura, Masayuki; Kobayashi, Toshiyuki; and Ritoh, Naotake, 4,616,545, Cl. 83-558.000.
Mizuno, Yuuzi: *See*—
Nezu, Yasutada; Tamura, Yutaka; Mizuno, Yuuzi; Iwamoto, Hiroshi; Yokota, Akihiro; and Maeda, Kiyoshi, 4,617,578, Cl. 346-108.000.
Mizutani, Isao: *See*—
Takeuchi, Tsunezo; and Mizutani, Isao, 4,616,427, Cl. 34-92.000.
MM Systems Corporation: *See*—
Nicholas, John D., 4,616,460, Cl. 52-396.000.
Mobil Oil Corporation: *See*—
Bell, Weldon K.; Haag, Werner O.; Kirker, Garry W.; and Klocke, Donald J., 4,617,288, Cl. 502-331.000.
Boyd, Dana M.; and Bustin, Franz, 4,617,008, Cl. 493-248.000.
Horodysky, Andrew G.; and Ashjian, Henry, 4,617,133, Cl. 252-32.500.
Mochizuki, Shoji: *See*—
Murata, Mitsuru; Kobayashi, Toyohiro; Mochizuki, Shoji; and Kawashima, Masamichi, 4,616,946, Cl. 400-704.000.
Modern Fibers, Inc.: *See*—
Cadenhead, Roy A., Sr., 4,617,208, Cl. 428-17.000.
Cadenhead, Roy A., Sr., 4,617,218, Cl. 428-92.000.
Moeller, Charles R., to International Totalizator Systems, Inc. Thermal printhead structure. 4,617,576, Cl. 346-76.0PH.
Molina, Jorge W., to Deutsch Fastener Corp. Panel fastener. 4,616,967, Cl. 411-105.000.
Moll, Manfred: *See*—
Romer, Rudolf; Bethmann, Karl W.; Jaeneke, Christian; and Moll, Manfred, 4,616,567, Cl. 102-489.000.
Moncelle, Michael E.: *See*—
Staniak, Waldema A.; Samuelson, Robert E.; and Moncelle, Michael E., 4,616,616, Cl. 123-357.000.
Monicell Limited: *See*—
Muirhead, Allen D., 4,617,463, Cl. 250-342.000.
Monsanto Company: *See*—
Balthazor, Terry M.; and Pulwer, Mitchell J., 4,617,415, Cl. 558-169.000.
Montedison S.p.A.: *See*—
Albizzati, Enrico, 4,617,285, Cl. 502-134.000.
Ugo, Renato; Campolmi, Stefano; and Carletti, Vittorio, 4,617,416, Cl. 558-242.000.
Montgomery, Robert E., to Laclede Professional Products, Inc. Enzymatic powder milk. 4,617,190, Cl. 426-61.000.
Montier, Patrick; Sauvestre, Jean-Claude; Bethmann, Karl W.; Bisping, Bernhard; and Wallow, Peter, to Rheinmetall GmbH; and L'Etat Francais represente par le Delegue General pour l'Armement Bureau des Brevets et Inventions. Armor penetrating projectile. 4,616,569, Cl. 102-517.000.
Moore, Alan R.; and Januszewski, Nicholas M., to Hayes-Albion Corporation. Anhydrous knife. 4,616,580, Cl. 111-7.000.
Moore, Arnold R. Rolling hoop game. 4,616,830, Cl. 273-126.00R.
Moore, David E., to Cryoblast, Inc. Cleaning method and apparatus. 4,617,064, Cl. 134-7.000.
Moore, James O., to Moore Products Company. Fluid velocity measuring method and apparatus. 4,616,510, Cl. 73-861.270.
Moore, John S., to Electro-Biology, Inc. Coil construction for electromagnetic treatment of an afflicted body region. 4,616,629, Cl. 128-1.500.
Moore Products Company: *See*—
Moore, James O., 4,616,510, Cl. 73-861.270.
Moore, Steve R.: *See*—
Farese, Virgil A.; Grover, Fred C.; Moore, Steve R.; and Gilfillan, Robert W., 4,616,395, Cl. 29-460.000.
Mooz, Dietrich; and Dirks, Rolf, to Felten & Guilleaume Energietechnik GmbH. High voltage, high rupture capacity fuse. 4,617,544, Cl. 337-3.000.
Morach, Eugen: *See*—
Rittner, Siegbert; Morach, Eugen; Schindler, Hubert; and John, Peter, 4,617,197, Cl. 427-180.000.
Moran, Michael J., to USM Corporation. Weighing apparatus with compartmentalized weighing bucket. 4,616,722, Cl. 177-99.000.
Morel, Claude: *See*—
Bigg, Dennis; Morel, Claude; and Sevrin, Mireille, 4,617,313, Cl. 514-402.000.
Morhard, Alfred. Method and apparatus for making tubes formed with holes in their peripheral wall. 4,616,540, Cl. 83-54.000.
Mori, Ken-ichi: *See*—
Suzuki, Kouhei; Saito, Tamio; and Mori, Ken-ichi, 4,617,471, Cl. 250-578.000.
Mori, Makihiko; Nakamura, Kazuo; Tanabe, Kanichiro; and Kimura, Atsushi, to Osaka Gas Company Limited; and Nireco Corporation. Method and apparatus for automatic quantitative measurement of textures by image analysis. 4,617,682, Cl. 382-28.000.
Mori, Sanae, to Daido Metal Company Ltd. Aluminum alloys of high wear resistance and good anti-seizure property suitable for use as bearing metals. 4,617,172, Cl. 420-530.000.
Mori, Seiichi, to Kabushiki Kaisha Toshiba. Method of manufacturing a semiconductor device with a stacked-gate-electrode structure. 4,616,402, Cl. 29-571.000.

Morimoto, Kiyoshi: *See*—
Kimura, Hiroshi; Hisajima, Masahiko; Shibata, Kiyoshi; and Morimoto, Kiyoshi, 4,616,924, Cl. 355-15.000.
Morinaka, Hideo: *See*—
Tsuzuki, Kenji; and Morinaka, Hideo, 4,617,397, Cl. 546-304.000.
Morino, Masuaki; and Takada, Yuji, to Sharp Kabushiki Kaisha. Memory module for a programmable electronic device. 4,617,650, Cl. 365-195.000.
Morisawa, Kunio; and Kondo, Tadashi, to Toyota Jidosha Kabushiki Kaisha. Transmission device housing construction with shaft lubricating oil shield cover generating lubricant pool. 4,616,526, Cl. 74-606.00R.
Morishita, Mitsuharu; and Kouge, Shinichi, to Mitsubishi Denki Kabushiki Kaisha. Charge control microcomputer device for vehicles. 4,617,626, Cl. 364-424.000.
Morita, Minoru: *See*—
Miyano, Seiji; Sumoto, Kunihiro; Morita, Minoru; and Sato, Fumio, 4,617,401, Cl. 548-453.000.
Morito, Motoyoshi: *See*—
Nakata, Yukio; Suda, Kaoru; Shiotsu, Osamu; and Morito, Motoyoshi, 4,617,565, Cl. 340-825.500.
Morley, Edmond; DiLorenzo, Neil; and Karras, James, to Wrap & Roll, Inc. Mobile film wrapping apparatus. 4,616,474, Cl. 53-556.000.
Morris, Brian V. Cleaning silver. 4,617,063, Cl. 134-6.000.
Morris, Tom C. Timber joining devices. 4,616,950, Cl. 403-231.000.
Morton Thiokol, Inc.: *See*—
Kugele, Thomas G.; Mesch, Keith A.; and Wursthorn, Karl R., 4,617,334, Cl. 524-177.000.
Mosser, Mark F.; and McMordie, Bruce G., to Sermatech International, Inc. Thick coating compositions. 4,617,056, Cl. 106-1.120.
Motorola, Inc.: *See*—
Au, Kenneth K., 4,617,480, Cl. 307-480.000.
Davidson, Allen L., 4,617,573, Cl. 343-844.000.
Levine, Stephen N., 4,617,520, Cl. 328-133.000.
Shak, Peter J.; and Ho, Roland K., 4,617,606, Cl. 361-283.000.
Mott, Philip J., to Borg-Warner Corporation. Pulley strap drive. 4,617,004, Cl. 474-8.000.
Mourou, Gerard; Norris, Theodore B.; and Sizer, Theodore, II, to University of Rochester. Dye laser. 4,617,665, Cl. 372-18.000.
MSK-verpackungs-Systeme Gesellschaft mit beschrankter Haftung: *See*—
Hannen, Reiner W., 4,616,471, Cl. 53-442.000.
MTU Motoren- und Turbinen-Union Friedrichshafen GmbH: *See*—
Deutschmann, Herbert; and Wolters, Gerd-Michael, 4,616,480, Cl. 60-600.000.
MTU Motoren-und Turbinen-Union Muenchen GmbH: *See*—
Merz, Herbert, 4,617,072, Cl. 156-89.000.
Muehlhausen, Robert A.: *See*—
Sobieski, James F.; and Muehlhausen, Robert A., 4,616,922, Cl. 355-14.00R.
Mueller, George B. Placket. 4,616,366, Cl. 2-115.000.
Mueller, Guenter W.: *See*—
Overcash, Donald A.; Hall, Lloyd E.; and Mueller, Guenter W., 4,616,504, Cl. 73-118.100.
Mueller, Walter B., to W. R. Grace & Co., Cryovac Div. Linear polyethylene stretch/shrink films. 4,617,241, Cl. 428-520.000.
Muenchow, John R.; Bock, Lawrence A.; and Lewis, Roger N., to U.S. Peroxygen Company. Acetylenic di(t-amyl peroxide) cross-linking/-blowing agents for polyethylene. 4,617,324, Cl. 521-96.000.
Muir, Ronald J., to Witco Corporation. Process for the preparation of overbased magnesium sulfonates. 4,617,135, Cl. 252-33.200.
Muirhead, Allen D., to Monicell Limited. Segmented optical system for an alarm system. 4,617,463, Cl. 250-342.000.
Muller, Egbert; Grauel, Ingolf; and Stumpe, Werner, to Robert Bosch GmbH. Tractor-trailer brake system including a trailer brake control valve. 4,616,881, Cl. 303-7.000.
Mullis, Kary B.: *See*—
Sheldon, Edward L., III; Levenson, Corey H.; Mullis, Kary B.; Rapoport, Henry; and Watson, Robert M., 4,617,261, Cl. 435-6.000.
Mullner, Paul: *See*—
Lugscheider, Walter; Mullner, Paul; Schiffer, Wilhelm; and Leutgob, Alois, 4,617,671, Cl. 373-22.000.
Munch, Otto; and Schibli, Thomas. Oil circulation circuit for internal combustion engine, and method of circulating lubricating oil. 4,616,609, Cl. 123-196.0AB.
Munoz, Miguel A. Harvesting/packing system. 4,616,468, Cl. 53-391.000.
Murakami, Susumu: *See*—
Kobayashi, Youichi; and Murakami, Susumu, 4,617,080, Cl. 156-359.000.
Muralidharan, Ramachandran; and Rao, Atambir S., to General Electric Company. Apparatus and method for reactor monitoring. 4,617,168, Cl. 376-247.000.
Muranaka, Shiaru: *See*—
Tanaka, Hideo; and Muranaka, Shiaru, 4,616,466, Cl. 53-75.000.
Murata Kikai Kabushiki Kaisha: *See*—
Matsui, Isamu; Uchida, Hiroshi; Nakanishi, Kazuo; and Shimano, Akira, 4,616,789, Cl. 242-35.50R.
Murata Manufacturing Co., Ltd.: *See*—
Nakamura, Takeshi; and Matsumoto, Ikuo, 4,617,488, Cl. 310-321.000.
Murata, Mitsuru; Kobayashi, Toyohiro; Mochizuki, Shoji; and Kawashima, Masamichi, to Mitsubishi Denki Kabushiki Kaisha. Printing device having external data input. 4,616,946, Cl. 400-704.000.
Murotani, Isao: *See*—
Okuyama, Shinichi; Mishina, Hitoshi; Furuse, Kazumaro; and Murotani, Isao, 4,617,187, Cl. 424-94.000.
Mutoh, Norio, to Mitsubishi Denki Kabushiki Kaisha. MTI Radar. 4,617,568, Cl. 342-160.000.
Muzzarelli, Gabriele. Moulding machine for the production of caciocavallo and similar cheeses. 4,616,988, Cl. 425-150.000.
Myers, Kimbrough I.: *See*—
Granzow, Robert H.; and Myers, Kimbrough I., 4,617,457, Cl. 235-379.000.
Myers, Ronald E., to B. F. Goodrich Company, The. Electrically conductive polymer blend. 4,617,353, Cl. 525-245.000.
Myers, William D., Jr.: *See*—
Stout, Gregg W.; and Myers, William D., Jr., 4,616,701, Cl. 166-55.100.
Nachtigall, Wilhelm: *See*—
Mewes, Heinz; Nachtigall, Wilhelm; Wienand, Michael, deceased; Wienand, Anneliese, legal representative; Wienand, Hans-Jurg W., heir; Wienand, Michael, heir; Wienand, Rudolf J., heir; Wienand, Karl F., heir; and Wienand, Elisabeth H. M., heir, 4,616,989, Cl. 425-203.000.
Naegele, Paul: *See*—
Hoppe, Udo; Seib, Karl; Naegele, Paul; and Martin, Roland, 4,617,390, Cl. 544-197.000.
Nagai, Junshiro, to Tokyo Electric Co., Ltd. Thermal dot type printing apparatus. 4,616,941, Cl. 400-120.000.
Nagai, Kazutoshi; and Aoyagi, Hirofumi, to Matsushita Electric Industrial Co., Ltd. Sanitary cleaning apparatus. 4,616,368, Cl. 4-420.200.
Nagai, Kiyoshi. Composite filter, observation system and filamentary display device. 4,616,902, Cl. 350-316.000.
Nagano, Masashi, to Shimano Industrial Company Limited. Front derailleur for a bicycle. 4,617,006, Cl. 474-80.000.
Nagaoka, Satoshi: *See*—
Ogawa, Tadashi; Nagaoka, Satoshi; and Ohashi, Yuichi, 4,617,259, Cl. 430-569.000.
Nagasaku, Eiichi: *See*—
Inagaki, Mitsuo; Takeda, Kenji; Iwanami, Shigeki; Sasaya, Hideaki; and Nagasaku, Eiichi, 4,616,984, Cl. 418-150.000.
Nagasawa, Hideo; Suzuki, Masao; and Hamano, Tsutomu, to NCR Corporation. Ribbon cassette with re-inking mechanism. 4,616,942, Cl. 400-196.100.
Nagashima, Hironobu; and Koyama, Hiroshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Light emission switching circuit for larynx stroboscope. 4,616,636, Cl. 128-23.000.
Nagashima, Nao: *See*—
Yoshida, Tadashi; Shimizu, Katsuichi; Arimoto, Shinobu; Maeshima, Katsuyoshi; Nagashima, Nao; and Watanabe, Asao, 4,617,596, Cl. 358-280.000.
Nagashima, Shigeo; Abe, Hitoshi; and Hatakeyama, Yasuhiko, to Hitachi, Ltd. Vector processor. 4,617,625, Cl. 364-200.000.
Nagata, Tetsuya, to Seiko Seiki Kabushiki Kaisha. Automatic work loading device for use in grinding machine. 4,616,448, Cl. 51-215.00H.
Nagata, Tomizou, to Japan Tobacco & Salt Public Corporation, The. Package forming apparatus. 4,616,475, Cl. 53-575.000.
Naiman, Michael I.; and Schield, John A., to Petrolite Corporation. Ester-containing halopolyalkylenes. 4,617,025, Cl. 44-62.000.
Naitoh, Ryuichi, to Pioneer Electronic Corporation. PU lock acquisition with scan restart upon false lock. 4,617,527, Cl. 331-4.000.
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Takahashi, Kenzo; Kumazaki, Nobuo; Yokoya, Hisao; Nakamura, Hironobu; and Kachi, Tadakatsu, 4,616,695, Cl. 165-54.000.
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Mori, Makihiko; Nakamura, Kazuo; Tanabe, Kanichiro; and Kimura, Atsushi, 4,617,682, Cl. 382-28.000.
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Senda, Kenichi; Ando, Masao; Nakamura, Kyoichi; and Nishida, Tatehiko, 4,617,322, Cl. 521-60.000.
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Hotta, Yuji; Abe, Takao; Ishii, Fumio; Kitamura, Shigehiro; Koshizuka, Kunihiro; and Nakamura, Masaki, 4,617,224, Cl. 428-212.000.
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Katou, Kazuo; Mizugami, Susumu; Tabuchi, Mamoru; Nakamura, Masayuki; Kobayashi, Toshiyuki; and Ritoh, Naotake, 4,616,545, Cl. 83-558.000.
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Taguchi, Takafumi; Nakano, Masahiro; Hiramoto, Nobuo; and Tominaga, Hideki, 4,616,599, Cl. 123-41.100.
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Ushijima, Hiroyuki; Shimomura, Hiroshi; and Nakayama, Masaaki, 4,616,962, Cl. 407-113.000.
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Okada, Fumio; Oba, Toshio; Nakazato, Morizo; and Isobe, Kenichi, 4,617,335, Cl. 524-265.000.
Nalepka, Paul: *See*—
Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,617,672, Cl. 373-79.000.
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Kinoshita, Akihiro; Namariyama, Yohichi; and Higashi, Hiromi, 4,617,254, Cl. 430-326.000.
Nambu, Masao, to Nippon Oil Company, Limited. Process for producing immobilized L-asparaginase preparations for the therapy of leukemia. 4,617,271, Cl. 435-182.000.
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Gross, William H.; and Naokawa, Toyojiro, 4,617,654, Cl. 369-46.000.
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Schreiber, William L.; Narula, Anubhav P. S.; and Hanna, Marie R., 4,617,145, Cl. 252-522.00R.
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Gordon, Richard E., 4,617,557, Cl. 340-568.000.
National Research Development Corporation: *See*—
Johns, Allan T.; and Martin, Michael A., 4,617,636, Cl. 364-482.000.
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Gross, William H.; and Naokawa, Toyojiro, 4,617,654, Cl. 369-46.000.
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Walker, James L.; and Mitry, Mourad T., 4,617,343, Cl. 524-817.000.
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Miura, Hirohisa; Satou, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,617,055, Cl. 75-251.000.
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Granzow, Robert H.; and Myers, Kimbrough I., 4,617,457, Cl. 235-379.000.
Nagasawa, Hideo; Suzuki, Masao; and Hamano, Tsutomu, 4,616,942, Cl. 400-196.100.
NEC Corporation: *See*—
Hoshi, Katsuji, 4,617,647, Cl. 365-189.000.
Masuda, Shinji, 4,617,481, Cl. 307-491.000.
Matsuda, Kohei, 4,617,482, Cl. 307-579.000.
Ooka, Hideyuki, 4,616,399, Cl. 29-571.000.
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Brooks, Phillip L., 4,617,679, Cl. 375-119.000.
Neely, Stephen A.: *See*—
Woodman, Daniel C.; and Neely, Stephen A., 4,616,857, Cl. 285-140.000.
Nelsen, Randy P.: *See*—
Smeenge, Paul A.; Wilson, Harold R.; and Nelsen, Randy P., 4,616,798, Cl. 248-281.100.
Nelson, Victor H. Microwave waveguide switch assembly. 4,617,538, Cl. 333-106.000.
Nestler, Heinz; and Barfurth, Dieter, to Dynamit Nobel AG. Modified titanium (IV) acetylacetonates. 4,617,408, Cl. 556-40.000.
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Newsome, Joe B.: *See*—
Shouse, George K., 4,616,450, Cl. 52-12.000.
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NGK Insulators, Ltd.: *See*—
Kajihara, Takehiro; and Suzuki, Mitsugu, 4,616,996, Cl. 432-148.00 J.
Ogawa, Yutaka; Ogasawara, Takayuki; and Hanzawa, Shigeru, 4,616,611, Cl. 123-270.000.
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Nicholas, John D., to MM Systems Corporation. Elastomeric glands. 4,616,460, Cl. 52-396.000.
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Nicholson, John H.: *See*—
Lings, Barry W.; and Nicholson, John H., 4,616,976, Cl. 416-97.00R.
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Bober, Helmut; Buthe, Theo; Coenen, Karl; Fartmann, Norbert; Herbertz, Klaus; Koch, Heinz; Kretschmer, Horst; Nienhaus, Clemens; Schardt, Peter; Schibrowski, Jurgen; and Schmandt, Willi, 4,617,003, Cl. 464-48.000.
Nifco, Inc.: *See*—
Kurosaki, Mutsuo, 4,616,861, Cl. 292-6.000.
Nihon Cement Co., Ltd.: *See*—
Yamazaki, Yukinori, 4,617,059, Cl. 106-118.000.
Nihon Technical Kabushiki Kaisha: *See*—
Ohashi, Tamaki, 4,616,516, Cl. 74-10.330.
Niigata Engineering Co., Ltd.: *See*—
Yasukawa, Hiroshi, 4,616,397, Cl. 29-568.000.
Niino, Koji: *See*—
Miyauchi, Tetsuro; and Niino, Koji, 4,617,486, Cl. 310-233.000.
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Narimatsu, Yoh; and Niizaki, Minoru, 4,617,604, Cl. 361-160.000.
Nikkel, Willem A.: *See*—
Jones, Thomas B., Jr.; and Nikkel, Willem A., 4,617,076, Cl. 156-205.000.
Nikko Co., Ltd.: *See*—
Ishimoto, Zenichi; and Konno, Tadashi, 4,617,002, Cl. 446-427.000.
Nikolov, Ivan D., deceased; by Dimova, Vassilka P., heir; Dimov, Dobromir I., heir; Dimov, Petar I., heir; Marinov, Marin I.; Peytchev, Ivan M.; Rashev, Tzolo V.; and Tchorbov, Iliya G., to Institute po Metaloznanie i Technologia na Metalite. Apparatus for the treatment and casting of metals and alloys in a closed space. 4,616,808, Cl. 266-207.000.
Nimura, Takayasu: *See*—
Nakamura, Shigenobu; Nimura, Takayasu; and Hotta, Toshiaki, 4,617,485, Cl. 310-65.000.
Nippon Acchakutansi Seizo Kabushiki Kaisha: *See*—
Matsui, Minoru, 4,616,396, Cl. 29-566.100.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Uchiyama, Yasuji; and Suzuki, Hideo, 4,616,546, Cl. 84-1.010.
Nippon Hoso Kyokai: *See*—
Tanioka, Kenkichi; Shidara, Keiichi; Kuriyama, Takao; Takasaki, Yukio; Hirai, Tadaaki; Nonaka, Yasuhiko; and Inoue, Eisuke, 4,617,248, Cl. 430-95.000.
Nippon Oil Company, Limited: *See*—
Nambu, Masao, 4,617,271, Cl. 435-182.000.
Nippon Sanso Kabushiki Kaisha: *See*—
Okada, Hidetake; and Urata, Satoshi, 4,617,037, Cl. 62-11.000.
Wakaizumi, Akira; and Kawakami, Hiroshi, 4,617,035, Cl. 55-389.000.
Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See*—
Saitu, Koichi; Ueda, Kenji; Ikeda, Yasuo; and Ono, Tetsuji, 4,617,289, Cl. 502-339.000.
Nippon Soken, Inc.: *See*—
Inagaki, Mitsuo; Takeda, Kenji; Iwanami, Shigeki; Sasaya, Hideaki; and Nagasaku, Eiichi, 4,616,984, Cl. 418-150.000.
Ootsuka, Yoshinori; Hattori, Tadashi; Ozaki, Tadashi; and Miura, Kazuhiko, 4,616,502, Cl. 73-35.000.
Saito, Kimitaka; Kohama, Tokio; Egami, Tsuneyuki; Saito, Tsutomu; Takahashi, Hiroshi; and Sato, Kunihiko, 4,616,619, Cl. 123-489.000.
Nippon Telegraph and Telephone Corp.: *See*—
Katagiri, Koichi; Hanamoto, Yoshihiro; Maeda, Satoru; and Taniguchi, Ikuo, 4,617,594, Cl. 358-150.000.
Nippon Thompson Co., Ltd.: *See*—
Komiya, Yoshiyuki, 4,616,885, Cl. 384-15.000.
Nippon Zeon Co. Ltd.: *See*—
Hiramatsu, Teruaki, 4,617,092, Cl. 203-1.000.
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Inagaki, Mitsuo; Takeda, Kenji; Iwanami, Shigeki; Sasaya, Hideaki; and Nagasaku, Eiichi, 4,616,984, Cl. 418-150.000.
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Mori, Makihiko; Nakamura, Kazuo; Tanabe, Kanichiro; and Kimura, Atsushi, 4,617,682, Cl. 382-28.000.
Nishi, Okihiro. Irrigating cannula for extracting lens nucleus for use in extracapsular cataract extraction. 4,617,018, Cl. 604-264.000.
Nishida, Tatehiko: *See*—
Senda, Kenichi; Ando, Masao; Nakamura, Kyoichi; and Nishida, Tatehiko, 4,617,322, Cl. 521-60.000.
Nishiguchi, Yasuo; and Minami, Keijiro, to Kyocera Corporation. Thermal head producing process. 4,617,088, Cl. 156-656.000.

Nishijima, Masaru: *See—*
Itoigawa, Masakatsu; and Nishijima, Masaru, 4,616,920, Cl. 355-3.0BE.
Nissan Motor Co., Ltd.: *See—*
Hayashi, Yoshimasa, 4,616,601, Cl. 123-41.210.
Hirano, Yoshinori, 4,616,600, Cl. 123-41.210.
Hirano, Yoshinori; and Kubozuka, Takao, 4,616,602, Cl. 123-41.270.
Kawaguchi, Hiroyuki; Saito, Hideyuki; and Yasuhara, Seishi, 4,616,615, Cl. 123-339.000.
Sugasawa, Fukashi; Kuroki, Junsuke; and Akatsu, Yohsuke, 4,616,848, Cl. 280-707.000.
Tanaka, Yoshikazu; Kumura, Haruyoshi; Abo, Keiju; Yamamuro, Sigeaki; and Hirano, Hiroyuki, 4,616,530, Cl. 74-851.000.
Nitco, Inc.: *See—*
Yokoyama, Naoshi, 4,617,121, Cl. 210-416.400.
Nixon, Charles E. Fast-moving eyelet guide for a group of braidable strands in a braiding machine. 4,616,553, Cl. 87-48.000.
Nobel, Fred I.; Ostrow, Barnet D.; and Schram, David N., to LeaRonal, Inc. Process and electrolyte for electroplating tin, lead or tin-lead alloys. 4,617,097, Cl. 204-44.400.
Nocek, James E., to Agway Inc. Novel method for quantitating structural and non-structural carbohydrates in feedstuffs. 4,617,276, Cl. 436-20.000.
Nogami, Takashi; and Nawa, Masayoshi, to Kao Soap Co., Ltd. Electrochemical battery. 4,617,243, Cl. 429-194.000.
Noguchi, Takaharu; Kobayashi, Masaharu; Arai, Takao; and Shibuya, Toshifumi, to Hitachi, Ltd. PCM signal recording/reproducing apparatus. 4,617,599, Cl. 360-32.000.
Nolan, James F., to Owens-Illinois, Inc. Vacuum indicating thermoplastic closure. 4,616,761, Cl. 215-271.000.
Nomura, Takuji. Carbide drill. 4,616,964, Cl. 408-144.000.
Nonaka, Yasuhiko: *See—*
Tanioka, Kenkichi; Shidara, Keiichi; Kuriyama, Takao; Takasaki, Yukio; Hirai, Tadaaki; Nonaka, Yasuhiko; and Inoue, Eisuke, 4,617,248, Cl. 430-95.000.
Nordica S.p.A.: *See—*
Bidoia, Vincenzo, 4,616,524, Cl. 74-553.000.
Nordson Corporation: *See—*
Baker, Robert G., 4,616,894, Cl. 339-15.000.
Marietta, Charles F.; and Holley, Kenneth, 4,616,782, Cl. 239-752.000.
Norris, Philip R., to Polaroid Corporation. Immersion type film processing apparatus. 4,616,915, Cl. 354-320.000.
Norris, Theodore B.: *See—*
Mourou, Gerard; Norris, Theodore B.; and Sizer, Theodore, II, 4,617,665, Cl. 372-18.000.
North American Philips Corporation: *See—*
Fitzpatrick, Brian J.; and Harnack, Phyllis M., 4,617,490, Cl. 313-478.000.
Goldowsky, Michael P., 4,617,448, Cl. 219-200.000.
Northern Telecom Limited: *See—*
Drynan, David S.; and Baker, David M., 4,617,657, Cl. 370-60.000.
Vea, Mathew P.; and Gupta, Vinita, 4,617,427, Cl. 179-84.0VF.
Nossek, Josef A., to Siemens Aktiengesellschaft. Method for digital quadrature amplitude modulation. 4,617,537, Cl. 332-48.000.
Nouwen, Bart. Container for the storage of photographic films and the like. 4,616,750, Cl. 206-316.000.
Novo Industri A/S: *See—*
Olsen, Frank; and Aunstrup, Knud, 4,617,273, Cl. 435-232.000.
Novogrodsky, William. Microfloss toothbrush. 4,616,374, Cl. 15-167.00R.
Novophalt Societe Anonyme: *See—*
Strommer, Erich, 4,617,201, Cl. 427-216.000.
Nowak, Reinhard, to Glatt GmbH. Method and apparatus for coating particulate materials with powdery materials. 4,617,191, Cl. 426-294.000.
Nozaki, Hitosi; and Oshima, Koichiro, to Du Pont de Nemours, E. I., and Company. Perfluorocarbon polymer oxidation catalyst and preparation of carbonyl compound. 4,617,153, Cl. 260-413.000.
Nozaki, Yasuo; Oishi, Yoshikazu; and Koga, Takanori, to Kawasaki Jukogyo Kabushiki Kaisha. Continuous excavating machine. 4,616,880, Cl. 299-39.000.
Nugent, Richard M.: *See—*
Boberski, William G.; Nugent, Richard M.; and Koren, Jeffrey G., 4,617,331, Cl. 523-420.000.
Nukushina, Masanori: *See—*
Takano, Kunio; and Nukushina, Masanori, 4,616,583, Cl. 112-121.120.
Nunokawa, Isao: *See—*
Fuyama, Moriaki; Tamura, Katsumi; Funyu, Isao; Nunokawa, Isao; Hanazono, Masanobu; and Hirastuka, Shigetoshi, 4,617,575, Cl. 346-76.0PH.
Nusser, Hermann, to Robert Bosch GmbH. Sliding-link mechanism. 4,616,518, Cl. 74-96.000.
Nuvatec, Inc.: *See—*
Slavik, William H., 4,617,472, Cl. 307-10.00R.
O & S Manufacturing Company: *See—*
Smith, Joseph E., Jr., 4,616,387, Cl. 29-149.50B.
O.U.T. Laboratories, Inc.: *See—*
Page, Edward J.; and Rock, James E., 4,617,188, Cl. 424-148.000.
O/Y Kyro A/B: *See—*
Reunamaki, Pauli T., 4,617,043, Cl. 65-29.000.
Oba, Toshio: *See—*
Okada, Fumio; Oba, Toshio; Nakazato, Morizo; and Isobe, Kenichi, 4,617,335, Cl. 524-265.000.
Ober, Christopher K.; and Lok, Kar P., to Xerox Corporation. Dispersion polymerization process for toner compositions. 4,617,249, Cl. 430-137.000.
Oberbeck, George A.: *See—*
Eisenhaure, David B.; Downer, James R.; Bliamptis, Tim E.; Oberbeck, George A.; and Hendrie, Susan D., 4,617,507, Cl. 322-4.000.
Obrecht, Werner; Haghiri-Tehrani, Yahya; and Hoppe, Joachim, to GAO Gesellschaft fur Automation und Organisation. Carrier element for an IC module. 4,617,605, Cl. 361-220.000.
O'Donohue, William T., to Caterpillar Inc. Drive assembly for drawing a movable welding carriage and method of welding. 4,617,447, Cl. 219-124.310.
Odorisio, Paul: *See—*
Pastor, Stephen D.; and Odorisio, Paul, 4,617,336, Cl. 524-291.000.
Odorzynski, Thomas W.: *See—*
Krueger, Duane A.; and Odorzynski, Thomas W., 4,617,240, Cl. 428-476.100.
Ogasawara, Takayuki: *See—*
Ogawa, Yutaka; Ogasawara, Takayuki; and Hanzawa, Shigeru, 4,616,611, Cl. 123-270.000.
Ogasawara, Tsunehiko; Arakawa, Yoshichika; Sumiya, Koji; and Sakaguchi, Yoshikazu, to Aisin Seiki Kabushiki Kaisha; and Aisin Warner Kabushiki Kaisha. Hydraulic and electronic control system for an automatic transmission. 4,616,531, Cl. 74-866.000.
Ogawa, Hirotoshi: *See—*
Sano, Nichiro; and Ogawa, Hirotoshi, 4,616,804, Cl. 251-267.000.
Ogawa, Tadashi; Nagaoka, Satoshi; and Ohashi, Yuichi, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 4,617,259, Cl. 430-569.000.
Ogawa, Yutaka; Ogasawara, Takayuki; and Hanzawa, Shigeru, to NGK Insulators, Ltd.; and Mazda Motor Corporation. Precombustion chamber construction of internal combustion engine. 4,616,611, Cl. 123-270.000.
Oguni, Takayuki: *See—*
Thai, Cao M.; Oguni, Takayuki; Kurematsu, Kazuhiko; and Kato, Tsuguo, 4,617,330, Cl. 523-220.000.
O'Hara, John J. Measuring scoop. 4,616,867, Cl. 294-55.000.
Ohara, Tsunemasa: *See—*
Suzuki, Masayuki; Fukahori, Hidehiko; Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; and Ohara, Tsunemasa, 4,616,913, Cl. 354-173.100.
Ohashi, Hiroshi: *See—*
Tanaka, Masaki; and Ohashi, Hiroshi, 4,617,340, Cl. 524-588.000.
Tanaka, Masaki; and Ohashi, Hiroshi, 4,617,344, Cl. 524-837.000.
Ohashi, Kazuo. Apparatus for retaining cooling pipes for an ice rink. 4,616,486, Cl. 62-235.000.
Ohashi, Tamaki, to Nihon Technical Kabushiki Kaisha. Push-button tuner. 4,616,516, Cl. 74-10.330.
Ohashi, Yuichi: *See—*
Ogawa, Tadashi; Nagaoka, Satoshi; and Ohashi, Yuichi, 4,617,259, Cl. 430-569.000.
Ohe, Takeshi: *See—*
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Ohira, Keiichi: *See—*
Hamada, Akira; Takahashi, Hisao; and Ohira, Keiichi, 4,617,231, Cl. 428-297.000.
Ohkawachi, Michihiro: *See—*
Miyauchi, Otohiko; Ohkawachi, Michihiro; and Yotsuyanagi, Junji, 4,616,766, Cl. 220-450.000.
Ohlin, L. Erik; Unger, H. Peter; and Westberg, J. Eric, to Seroteknik HG. Method and apparatus for centrifugal batch separation of blood. 4,617,009, Cl. 494-21.000.
Ohmiya, Takeo: *See—*
Namikoshi, Hajime; and Ohmiya, Takeo, 4,617,385, Cl. 536-98.000.
Ohmura, Ryuichi, to Fuji Kogyo Co., Ltd. Line guide for fishing rod. 4,616,438, Cl. 43-24.000.
Ohta, Toshihiko; Okada, Fujio; and Okumoto, Kiyokazu, to Toyo Boseki Kabushiki Kaisha. Stretched polyethylene filaments of high strength and high modulus, and their production. 4,617,233, Cl. 428-364.000.
Ohyama, Iwane, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for chamfering. 4,616,966, Cl. 409-132.000.
Oishi, Yoshikazu: *See—*
Nozaki, Yasuo; Oishi, Yoshikazu; and Koga, Takanori, 4,616,880, Cl. 299-39.000.
Okada, Fujio: *See—*
Ohta, Toshihiko; Okada, Fujio; and Okumoto, Kiyokazu, 4,617,233, Cl. 428-364.000.
Okada, Fumio; Oba, Toshio; Nakazato, Morizo; and Isobe, Kenichi, to Shin-Etsu Chemical Co., Ltd. Method for improving mold releasability of a polymeric material. 4,617,335, Cl. 524-265.000.
Okada, Hidetake; and Urata, Satoshi, to Nippon Sanso Kabushiki Kaisha. Nitrogen production method. 4,617,037, Cl. 62-11.000.
Okada, Junichi: *See—*
Koto, Haruhiko; Okada, Junichi; Ishii, Hiroshi; and Sawada, Kenji, 4,617,581, Cl. 346-140.00R.
Okamoto, Kiyohide; and Okita, Ryosuke, to Mitsubishi Denki Kabushiki Kaisha. Magnetic particle type electromagnetic coupling apparatus. 4,616,740, Cl. 192-21.500.
Okamoto, Yuji, to Toyota Jidosha Kabushiki Kaisha. Construction of door glass runs in motor vehicle. 4,616,446, Cl. 49-441.000.
Okida, Yoshishiro: *See—*
Akira, Takashima; Kobayashi, Masahiko; Nasu, Hitoo; Okida, Yoshishiro; and Tsuji, Kazuhiko, 4,616,872, Cl. 296-190.000.

Okita, Ryosuke: *See*—
Okamoto, Kiyohide; and Okita, Ryosuke, 4,616,740, Cl. 192-21.500.
Okuda, Tadao, to Sanyo Electric Co., Ltd. Induction heating apparatus with controlled switching device for improved efficiency. 4,617,442, Cl. 219-10.770.
Okuda, Toshio, to 'Totes', Incorporated. Handle with carrying strap. 4,616,868, Cl. 294-137.000.
Okumoto, Kiyokazu: *See*—
Ohta, Toshihiko; Okada, Fujio; and Okumoto, Kiyokazu, 4,617,233, Cl. 428-364.000.
Okuyama, Shinichi; Mishina, Hitoshi; Furuse, Kazumaro; and Murotani, Isao, to Eisai Co., Ltd. Therapeutic method for treating radiation ulcers. 4,617,187, Cl. 424-94.000.
Oles, Paul M., to Y Technipak Corp. Shuttle-type blow molding machine with in-mold labeling. 4,616,992, Cl. 425-503.000.
Olin Hunt Specialty Products, Inc.: *See*—
Sizensky, Joseph J., 4,617,251, Cl. 430-256.000.
Oliver, Larry R.: *See*—
Miranti, Joseph P., Jr.; Oliver, Larry R.; and Johnson, Clyde O., 4,617,007, Cl. 474-201.000.
Olsen, Frank; and Aunstrup, Knud, to Novo Industri A/S. Alpha-acetolactate decarboxylase enzyme and preparation thereof. 4,617,273, Cl. 435-232.000.
Olson, Keith E.: *See*—
Kirkwood, Marda K.; and Olson, Keith E., 4,617,272, Cl. 435-183.000.
Olsson, Sven-Gunnar: *See*—
Cewers, Goeran; Johansson, Jan; and Olsson, Sven-Gunnar, 4,616,801, Cl. 251-6.000.
OMI International Corporation: *See*—
Darken, Jeffrey, 4,617,205, Cl. 427-305.000.
Tomaszewski, Thaddeus W., 4,617,095, Cl. 204-41.000.
Omnichem, S.A.: *See*—
Hannart, Jean A. A. J., 4,617,305, Cl. 514-278.000.
Oneyama, Naotake; and Yoshikawa, Akihisa, to Shokestu Kinzoku Kogyo Kabushiki Kaisha. Cylinder driving apparatus. 4,616,476, Cl. 60-414.000.
Ono, Kenji: *See*—
Watanabe, Hiroyuki; Hamada, Eiichi; Hayashi, Motomu; and Ono, Kenji, 4,616,445, Cl. 49-374.000.
Ono, Takuro: *See*—
Kodama, Hisashi; and Ono, Takuro, 4,616,607, Cl. 123-90.460.
Ono, Tetsuji: *See*—
Saito, Koichi; Ueda, Kenji; Ikeda, Yasuo; and Ono, Tetsuji, 4,617,289, Cl. 502-339.000.
Onodera, Chikau: *See*—
Kawai, Yoshio; Kitagawa, Kiyoshi; Endo, Kazue; and Onodera, Chikau, 4,617,104, Cl. 204-301.000.
Onuki, Tadayoshi: *See*—
Kishi, Hajimu; Onuki, Tadayoshi; and Kurakake, Mitsuo, 4,617,640, Cl. 364-708.000.
Ooka, Hideyuki, to NEC Corporation. Method of manufacturing an insulated gate field effect transistor. 4,616,399, Cl. 29-571.000.
Oonishi, Akiyoshi; Doi, Shuhei; and Shimada, Takeo, to Mitsubishi Petrochemical Co., Ltd. Ethylene copolymer. 4,617,365, Cl. 526-265.000.
Ootsuka, Yoshinori; Hattori, Tadashi; Ozaki, Tadashi; and Miura, Kazuhiko, to Nippon Soken, Inc. Knocking detection system for internal combustion engine. 4,616,502, Cl. 73-35.000.
Ophoff, Paul A., to Siemens Aktiengesellschaft. Digital-to-analog converter with potential separation. 4,617,551, Cl. 340-347.0DA.
Orgeron, Orey C. Escape device for use in high-rise structures. 4,616,735, Cl. 182-238.000.
Orii, Makoto, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Buffer device. 4,616,737, Cl. 188-184.000.
Orth, Dieter: *See*—
Wahlig, Helmut; Dingeldein, Elvira; Kirchlechner, Richard; Orth, Dieter; and Rogalski, Werner, 4,617,293, Cl. 514-41.000.
Ortho Pharmaceutical Corporation: *See*—
Bandurco, Victor T.; Bell, Stanley C.; Combs, Donald W.; and Falotico, Robert, 4,617,392, Cl. 544-250.000.
Conley, Richard A.; and Barton, Donald L., 4,617,417, Cl. 560-29.000.
Osaka Gas Company Limited: *See*—
Mori, Makihiko; Nakamura, Kazuo; Tanabe, Kanichiro; and Kimura, Atsushi, 4,617,682, Cl. 382-28.000.
O'Shea, Richard L.; and Merrill, Philip R., to Raytheon Company. Reflective phase shifter. 4,617,539, Cl. 333-164.000.
Oshefsky, Daniel J.; Gavronski, Paul A.; Vogt, Robert E.; and Rajala, Gregory J., to Kimberly-Clark Corporation. Method and apparatus for applying discrete strips to a web of material. 4,617,082, Cl. 156-447.000.
Oshima, Koichiro: *See*—
Nozaki, Hitosi; and Oshima, Koichiro, 4,617,153, Cl. 260-413.000.
Ostreicher, Eugene A., to AMF Inc. Particulate filter aid, filter bed and process. 4,617,128, Cl. 210-679.000.
Ostrow, Barnet D.: *See*—
Nobel, Fred I.; Ostrow, Barnet D.; and Schram, David N., 4,617,097, Cl. 204-44.400.
Otsuji, Shogo: *See*—
Yamada, Hideaki; Otsuji, Shogo; Isobe, Kimiyasu; Matsunaga, Kuniyoshi; and Inukai, Tadahiko, 4,617,263, Cl. 435-25.000.
Ott, Karl-Heinz: *See*—
Eichenauer, Herbert; and Ott, Karl-Heinz, 4,617,358, Cl. 526-81.000.
Otto, Dennis L.: *See*—
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Ou, Jung-Hsing: *See*—
Hartmann, Robert F.; Wong, Sau-Ching; Chan, Yiu-Fai; and Ou, Jung-Hsing, 4,617,479, Cl. 307-465.000.
Oudman, Dirk J., to Wigboma B.V. Adjustable work top. 4,616,887, Cl. 312-140.100.
Outillages Scientifiques et de Laboratoires O.S.L. S.A.: *See*—
Simonetti, Jean-Pierre, 4,616,775, Cl. 228-37.000.
Overcash, Donald A.; Hall, Lloyd E.; and Mueller, Guenter W., to Duncan Electronics. Throttle position sensor. 4,616,504, Cl. 73-118.100.
Overlach, Knud: *See*—
Pietzsch, Ludwig; Overlach, Knud; and Gassner, Siegfried, 4,616,723, Cl. 177-211.000.
Overturf, John R., to Transmet Corporation. Method for making roofing. 4,617,198, Cl. 427-186.000.
Ovshinsky, Herbert C.: *See*—
Nath, Prem; Izu, Masatsugu; Ovshinsky, Herbert C.; and Singh, Avtar, 4,617,421, Cl. 136-244.000.
Owens-Illinois, Inc.: *See*—
Nolan, James F., 4,616,761, Cl. 215-271.000.
Owensby, Joseph E.; Dobbins, Frederick A.; and Austin, Billy W., to W. R. Grace & Co., Cryovac Div. Method and apparatus for loading side-seal bags. 4,616,472, Cl. 53-459.000.
Oyama, Yoshishige: *See*—
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Ozaki, Tadashi: *See*—
Ootsuka, Yoshinori; Hattori, Tadashi; Ozaki, Tadashi; and Miura, Kazuhiko, 4,616,502, Cl. 73-35.000.
P.R.C., Ltd.: *See*—
Penn, Wayne M., 4,617,667, Cl. 372-35.000.
Paape, Kenneth L.: *See*—
Kellogg, Walter J.; DeVault, Birch L.; and Paape, Kenneth L., 4,617,546, Cl. 337-170.000.
Padgett, H. Pat: *See*—
Fisher, Gary H.; and Padgett, H. Pat, 4,616,777, Cl. 236-44.00C.
Page, Edward J.; and Rock, James E., to O.U.T. Laboratories, Inc. Natural insecticides employing borax and carob. 4,617,188, Cl. 424-148.000.
Page, Matthew A.; Libbey, William J.; and Lundeen, Allan J., to Du Pont de Nemours, E. I., and Company. Ethylene polymer composition for blow molding. 4,617,352, Cl. 525-240.000.
Paine, John C., to Caterpillar Industrial Inc. Hour meter apparatus and method. 4,617,639, Cl. 364-569.000.
Palasz, Peter D.: *See*—
Chum, Helena L.; Ratcliff, Matthew A.; and Palasz, Peter D., 4,617,090, Cl. 162-16.000.
Pall Corporation: *See*—
Pall, David B.; Degen, Peter J.; and Gsell, Thomas C., 4,617,124, Cl. 210-638.000.
Pall, David B.; Degen, Peter J.; and Gsell, Thomas C., to Pall Corporation. Polymeric microfibrous filter sheet, preparation and use. 4,617,124, Cl. 210-638.000.
Pallie, Kemal D.; and Dessauges, Gerald, to Ciba-Geigy Corporation. Process for reducing the content of chlorine in glycidyl compounds. 4,617,357, Cl. 525-506.000.
Pannier, Dominique: *See*—
Pigneul, Raymond; Pannier, Dominique; and Tresca, Benoit, 4,617,022, Cl. 604-391.000.
Paoluccio, John A. Air mixing device and method for preventing insects from finding human beings. 4,616,557, Cl. 98-31.500.
Paoluccio, John A. Contamination control apparatus. 4,616,620, Cl. 123-573.000.
Parein, Eric W. Elements of a construction or assembly set, and accessories. 4,617,001, Cl. 446-102.000.
Paretskoi, Mikko, to Turvaura OY. Means for cleaning a blade of a window glass wiper of a vehicle. 4,616,376, Cl. 15-250.00R.
Parikh, Mihir: *See*—
Tullis, Barclay J.; Parikh, Mihir; Thrasher, David L.; and Johnston, Mark E., 4,616,683, Cl. 141-98.000.
Paris, Jean-Marc: *See*—
Corbet, Jean-Pierre; Cotrel, Claude; Farge, Daniel; and Paris, Jean-Marc, 4,617,290, Cl. 514-11.000.
Corbet, Jean-Pierre; Cotrel, Claude; Farge, Daniel; and Paris, Jean-Marc, 4,617,377, Cl. 530-317.000.
Park, In Pio: *See*—
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Park, Kyong; and Chen, Hung-Chih, to Kavlico Corporation. High pressure capacitive transducer. 4,617,607, Cl. 361-283.000.
Park, Sea C.; and Park, In Pio. Closed end wrench. 4,616,534, Cl. 81-99.000.
Parker Chemical Company: *See*—
King, Peter F., 4,617,068, Cl. 148-6.14R.
Parker, Gregory H. Insulated window cover apparatus. 4,616,456, Cl. 52-202.000.
Parker Hannifin Corporation: *See*—
Simmons, Harold C.; and Harding, Curtis F., 4,616,784, Cl. 239-404.000.
Parker, Richard J., to Rolls-Royce plc. Method of observing change in a shape. 4,616,932, Cl. 356-376.000.
Parker, Robert F. Portable grill. 4,616,624, Cl. 126-9.00R.

Parman, David G.: *See—*
Weitzel, Harold B.; and Parman, David G., 4,617,449, Cl. 219-301.000.
Parmelee Industries, Inc.: *See—*
McCreadie, John B., 4,616,647, Cl. 128-206.190.
Partridge, John J.: *See—*
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Paschke, Edward E.: *See—*
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Paschke, Joachim: *See—*
Sacco, Bruno; Tomforde, Johann; Paschke, Joachim; and Leschke, Harald, 4,616,869, Cl. 296-1.00S.
Pasmans, Johannes M. M.: *See—*
Haisma, Jan; Heller, Petrus; Pasmans, Johannes M. M.; and Biermann, Udo K. P., 4,617,206, Cl. 427-374.100.
Pastor, Stephen D.; and Odorisio, Paul, to Ciba-Geigy Corporation. Acylated calixarene stabilizers. 4,617,336, Cl. 524-291.000.
Patchett, Arthur A.; and Wyvratt, Matthew J., Jr., to Merck & Co., Inc. Sulfoxide and sulfone derivatives of bicyclic lactams as antihypertensives. 4,617,301, Cl. 514-214.000.
Patel, Naginbhai: *See—*
Girijavallabhan, Viyyoor M.; Ganguly, Ashit K.; Patel, Naginbhai; and Liu, Yi-Tsung, 4,617,300, Cl. 514-192.000.
Patel, Suresh U.: *See—*
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Paulik, Ernst, to Siemens Aktiengesellschaft. Circuit arrangement for a blocking oscillator switching power unit. 4,617,533, Cl. 331-113.00A.
Peacock, Bobbie: *See—*
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Peiffer, Dennis G.: *See—*
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Pellegrini, Maurice: *See—*
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Pellkofer, Dieter: *See—*
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Penn, Wayne M., to P.R.C., Ltd. Gas laser tube assembly. 4,617,667, Cl. 372-35.000.
Pennington, Keith S.: *See—*
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Pensavecchia, Anita. Food server aid. 4,616,853, Cl. 283-60.00A.
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Perez, Juan J. B., to Jefatura de Ingenieros del Ejercito. Loading and unloading ramp unit for railway convoy train. 4,616,373, Cl. 14-72.500.
Perfect, Alan J., to LaFrance Corporation. Identification card holder. 4,616,435, Cl. 40-6.000.
Perini Corporation: *See—*
Farese, Virgil A.; Grover, Fred C.; Moore, Steve R.; and Gilfillan, Robert W., 4,616,395, Cl. 29-460.000.
Perkin-Elmer Corporation, The: *See—*
LaFiandra, Carlo; and Kreuzer, Justin, 4,617,681, Cl. 378-34.000.
Tracy, David H.; and Balistee, Brian G., 4,617,079, Cl. 156-345.000.
Perkins Engines Group Limited: *See—*
Jane, Phillip A., 4,616,612, Cl. 123-276.000.
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Brodzinski, Ronald L.; Perkins, Richard W.; Rieck, Henry G.; and Wogman, Ned A., 4,617,169, Cl. 376-257.000.
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Perlman, Michael E.: *See—*
Bardos, Thomas J.; and Perlman, Michael E., 4,617,398, Cl. 548-112.000.
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Bagli, Jehan F.; and Peseckis, Steven M., 4,617,393, Cl. 544-319.000.
Peterman, Robert J., to Spacesaver Corporation. Safety brake for mobile storage apparatus. 4,616,888, Cl. 312-201.000.
Peterman, Robert J., to Spacesaver Corporation. Anti-roll brake for mobile storage system. 4,616,889, Cl. 312-201.000.
Petersen, Kurt E.: *See—*
Chuang, Tung J.; Houle, Frances A.; and Petersen, Kurt E., 4,617,086, Cl. 156-643.000.
Peterson, Johnny W., to Board of Regents, University of Texas System. Colony blot assay for enterotoxigenic bacteria. 4,617,265, Cl. 435-38.000.
Petrolite Corporation: *See—*
Naiman, Michael I.; and Schield, John A., 4,617,025, Cl. 44-62.000.
Petterson, William C.: *See—*
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Pettibone, Craig R., to Specialty Products, Inc. Toe adjustment apparatus. 4,616,845, Cl. 280-661.000.
Pettit, Thomas L. Snap-in window boot for truck-camper combinations and the like. 4,616,871, Cl. 296-166.000.
Peyman, Gholam A. Intraocular lenses with openable haptic loops. 4,617,023, Cl. 623-6.000.
Peytchev, Ivan M.: *See—*
Nikolov, Ivan D., deceased; Dimova, Vassilka P., heir; Dimov, Dobromir I., heir; Dimov, Petar I., heir; Marinov, Marin I.; Peytchev, Ivan M.; Rashev, Tzolo V.; and Tchorbov, Iliya G., 4,616,808, Cl. 266-207.000.
Pez, Guido P.; and Carlin, Richard T., to Air Products and Chemicals, Inc. Method for gas separation. 4,617,029, Cl. 55-16.000.
Pfaff Industriemaschinen GmbH: *See—*
Hager, Walter, 4,616,582, Cl. 112-76.000.
Pfeifer, Josef, to Ciba-Geigy Corporation. Polyamide, from condensed cyclic dicarboxylic acid and branched chain diamine. 4,617,375, Cl. 528-344.000.
Pfeifer, Josef: *See—*
Mayer, Carl W.; Kvita, Vratislav; and Pfeifer, Josef, 4,617,151, Cl. 540-1.000.
Pfeiffer, Thomas J.: *See—*
Krause, Richard H.; Pfeiffer, Thomas J.; and Horvath, Vincent V., 4,617,638, Cl. 364-557.000.
Pfizer Inc.: *See—*
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Philip A. Hunt Chemical Corporation: *See—*
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Phillips Petroleum Company: *See—*
Hinojos, Antonio R.; and Bone, Bertram T., Jr., 4,617,110, Cl. 208-211.000.
Martin, Joel L., 4,617,361, Cl. 526-114.000.
Shyr, Yen-Shin; and Johnson, Marvin M., 4,617,108, Cl. 208-111.000.
Washer, Stone P.; and Bush, Bruce A., 4,616,669, Cl. 137-1.000.
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Phillips, Steven D.; Reece, Jeffrey M.; and Wyatt, Philip J., to Wyatt Technology Corporation. Sample cell for light scattering measurements. 4,616,927, Cl. 356-338.000.
Piegay, Yves: *See—*
Echevin, Michel; Piegay, Yves; and Legrand, Maurice, 4,616,842, Cl. 280-602.000.
Pietsch, Helge; Rink, Manfred; and Suss, Christian, to Gebr. Isringhausen. Vehicle seat assembly. 4,616,874, Cl. 297-321.000.
Pietzsch, Ludwig; Overlach, Knud; and Gassner, Siegfried, to Ing Ludwig Pietzsch GmbH & Co. Wheel load indicator. 4,616,723, Cl. 177-211.000.
Pigneul, Raymond; Pannier, Dominique; and Tresca, Benoit, to Beghin-Say S.A. Disposable hygienic article with removable belt. 4,617,022, Cl. 604-391.000.
Pilant, Frank J.; and Cornsweet, Milton D. Heat-released plug. 4,616,710, Cl. 169-41.000.
Pina, Felice: *See—*
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Pioneer Electronic Corporation: *See—*
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Plastic Recycling Foundation, Inc.: *See—*
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Plavac, Frank, to Chevron Research Company. Glycidol modified succinimides. 4,617,137, Cl. 252-49.600.
Plessey Company plc, The: *See—*
Chopping, Geoffrey; Lawrie, Ian J.; and Maric, Milan Z., 4,617,659, Cl. 370-100.000.
Plueddemann, Edwin P., to Dow Corning Corporation. Oil and water repellent coating compositions. 4,617,057, Cl. 106-2.000.
Plummer, Ernest L., to FMC Corporation. Insecticidal heteroaryl substituted phenyl benzoylureas. 4,617,316, Cl. 514-438.000.
Plungis, Donald W.; Seymour, Charles S.; and Higgins, William, to Analysts, Inc. Timer trigger for capillary tube viscometer and method of measuring oil properties. 4,616,503, Cl. 73-55.000.
Plus Corporation: *See—*
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Podesta , Roberto: *See*—
Costanzi, Silvestro; Traverso, Enrico; Podesta , Roberto; Gussoni, Damiano; and Busetto, Carlo, 4,617,333, Cl. 524-96.000.
Podszun, Wolfgang, to Bayer Aktiengesellschaft. Inorganic-organic fillers for polymerizable compositions. 4,617,327, Cl. 523-116.000.
Poirier, Marc-Andre, to Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines & Resources. Roofing asphalt compositions containing hydrocracked pitch. 4,617,062, Cl. 106-273.00R.
Poisson, Pierre: *See*—
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Polaroid Corporation: *See*—
Borror, Alan L.; Cincotta, Louis; and Lee, John W., Jr., 4,617,402, Cl. 548-455.000.
Hicks, John W., Jr., 4,616,898, Cl. 350-96.150.
Norris, Philip R., 4,616,915, Cl. 354-320.000.
Taylor, Lloyd D.; and Haubs, Michael K., 4,617,253, Cl. 430-323.000.
Poldervaart, Leendert: *See*—
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Pomeroy, Philip S.: *See*—
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Pommer, Ernst-Heinrich: *See*—
Eicken, Karl; Graf, Hermann; Gramlich, Walter; Sauter, Hubert; Rentzea, Costin; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, 4,617,303, Cl. 514-258.000.
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Poppe, Wassily; Chen, Yu-Tsai; and Paschke, Edward E., to Amoco Corporation. Crystalline copolyamide from terephthalic acid, isophthalic acid and C_6 diamines. 4,617,342, Cl. 524-606.000.
Portalupi, Steven J.; and Riggs, Robert S., to Goodyear Tire & Rubber Company, The. Apparatus and method for feeding strip material for application to a drum. 4,617,074, Cl. 156-130.000.
Porter, Joseph W.: *See*—
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Potard, Claude, to Commissariat a l'Energie Atomique. Process for the production of metallic or semimetallic shaped elements. 4,617,084, Cl. 156-607.000.
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Poutrait-Morin: *See*—
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PPG Industries, Inc.: *See*—
Boberski, William G.; Nugent, Richard M.; and Koren, Jeffrey G., 4,617,331, Cl. 523-420.000.
DuBois, Donald W., 4,617,196, Cl. 427-123.000.
Krivak, Thomas G.; Heimburger, Stanley A.; and Dew, James T., 4,617,294, Cl. 514-52.000.
Pratt Burnerd International Limited: *See*—
Jackson, Joseph F.; and Waite, Ralph A., 4,616,838, Cl. 279-4.000.
Precision Handling Devices Inc.: *See*—
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Precision Surgical Instruments, Inc.: *See*—
Caspari, Richard B.; Whipple, Terry L.; and Thimsen, James A., 4,616,637, Cl. 128-84.00R.
Presnell, John B.: *See*—
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Prezas, Dimitrios P.; and Zimmerman, Gustavus H., III, to AT&T Bell Laboratories. Heart rate detection utilizing autoregressive analysis. 4,616,659, Cl. 128-706.000.
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Whiteley, Gordon R.; Pritchard, Cynthia G.; and Barrett, Sharon S., 4,617,264, Cl. 435-34.000.
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Saitoh, Seishiro: *See—*
Suzuki, Hiroshi; Kanai, Masatatsu; Saitoh, Seishiro; and Kanai, Shigeru, 4,616,876, Cl. 297-328.000.
Sajima, Yasuo: *See—*
Sato, Kimihiko; Sajima, Yasuo; Nakao, Makoto; and Iwamoto, Junjiro, 4,617,101, Cl. 204-252.000.
Sakaguchi, Genta: *See—*
Makio, Tatsumi; Hayakawa, Kazumasa; and Sakaguchi, Genta, 4,616,819, Cl. 271-122.000.
Sakaguchi, Yoshikazu: *See—*
Ogasawara, Tsunehiko; Arakawa, Yoshichika; Sumiya, Koji; and Sakaguchi, Yoshikazu, 4,616,531, Cl. 74-866.000.
Sakai, Takahiro; and Minemoto, Isamu, to Toyota Jidosha Kabushiki Kaisha. Automatic transmission hydraulic pressure control system with one-way fluid drain passage bypassing downshift timing subsystem. 4,616,532, Cl. 74-869.000.
Sakamoto, Nobuo: *See—*
Menjo, Hiroshi; Sakamoto, Nobuo; and Watanabe, Yoshikazu, 4,617,258, Cl. 430-566.000.
Sakamoto, Yasuhiko, to Fujitsu Limited. Faulty-memory processing method and apparatus. 4,617,660, Cl. 371-13.000.
Sakamoto, Yoshio: *See—*
Matsuura, Mitsuyuki; Fujita, Takashi; and Sakamoto, Yoshio, 4,617,284, Cl. 502-111.000.
Sakaue, Shiyuki; Sugimoto, Koichi; and Arai, Shinichi, to Hitachi, Ltd. Method and apparatus for controlling a robot hand along a predetermined path. 4,617,502, Cl. 318-568.000.
Sakurai, Masaaki, to Canon Kabushiki Kaisha. Fixing device. 4,616,917, Cl. 355-3.0FU.
Salladay, David G.; and Kachelman, Donald L., to Tennessee Valley Authority. Sodium bentonite-UAN suspension without chemical dispersants. 4,617,048, Cl. 71-30.000.
Salyer, Ival O.; and Griffen, Charles W., to University of Dayton. Phase change compositions. 4,617,332, Cl. 524-4.000.
Samodovitz, Arthur J. Warm-up circuit with timed shut-off of the warm-up current. 4,617,496, Cl. 315-208.000.
Samson, Wilfred J.; and Frisbie, Jeffrey S., to Advanced Cardiovascular Systems, Inc. Balloon dilatation catheter with advanceable non-removable guide wire. 4,616,653, Cl. 128-344.000.
Samuelson, Robert E.: *See—*
Staniak, Waldema A.; Samuelson, Robert E.; and Moncelle, Michael E., 4,616,616, Cl. 123-357.000.
Sanden Corporation: *See—*
Matsushita, Takashi, 4,616,742, Cl. 192-84.00C.
Sandoz Ltd.: *See—*
Welzel, Dieter; and Buhlmann, Hans, 4,617,306, Cl. 514-288.000.

Sankyo Aluminium Industry Company Limited: *See*—
Araki, Tokio; and Aoki, Iwao, 4,616,443, Cl. 49-252.000.

Sano, Nichiro; and Ogawa, Hirotoshi, to Asahi Yukizai Kogyo Co., Ltd. Gate valve. 4,616,804, Cl. 251-267.000.

Sano, Yutaka: *See*—
Kamamori, Hitoshi; Suginoya, Mitsuru; Iwasa, Koji; Sano, Yutaka; and Terada, Yumiko, 4,617,094, Cl. 204-18.100.

Sanyo Electric Co., Ltd.: *See*—
Koide, Satoshi; and Hiejima, Kiyoshi, 4,617,441, Cl. 219-10.770.
Nakata, Takeshi, 4,617,438, Cl. 219-10.55B.
Okuda, Tadao, 4,617,442, Cl. 219-10.770.
Tatsuta, Nobuhiro, 4,617,424, Cl. 179-2.0EA.

Sara Lee Corporation: *See*—
Thompson, Kenneth J.; Rosenquist, Joel C.; and Foster, Wayne G., 4,616,820, Cl. 271-189.000.

SARCMI S.p.A.: *See*—
Tincati, Franco, 4,616,684, Cl. 141-114.000.

Saris, Leo: *See*—
Boes, Josef; and Saris, Leo, 4,617,450, Cl. 219-345.000.

Sasaya, Hideaki: *See*—
Inagaki, Mitsuo; Takeda, Kenji; Iwanami, Shigeki; Sasaya, Hideaki; and Nagasaku, Eiichi, 4,616,984, Cl. 418-150.000.

Sato, Fumio: *See*—
Miyano, Seiji; Sumoto, Kunihiro; Morita, Minoru; and Sato, Fumio, 4,617,401, Cl. 548-453.000.

Sato, Hideo: *See*—
Inoue, Hiromichi; Inukai, Takashi; Goto, Yasuyuki; Sato, Hideo; and Fukui, Masahiro, 4,617,141, Cl. 252-299.630.

Sato, Hiroshi: *See*—
Takahashi, Kazuo; Sato, Hiroshi; and Kosugi, Masao, 4,617,469, Cl. 250-548.000.

Sato, Kimihiko; Sajima, Yasuo; Nakao, Makoto; and Iwamoto, Junjiro, to Asahi Glass Company Ltd. Alkali metal chloride electrolyzing cell. 4,617,101, Cl. 204-252.000.

Sato, Kunihiko: *See*—
Saito, Kimitaka; Kohama, Tokio; Egami, Tsuneyuki; Saito, Tsutomu; Takahashi, Hiroshi; and Sato, Kunihiko, 4,616,619, Cl. 123-489.000.

Sato, Tatsuru: *See*—
Suzuki, Kiyosuke; Fukuma, Toshiaki; and Sato, Tatsuru, 4,617,247, Cl. 430-81.000.

Satoh, Shuichi: *See*—
Yazu, Shuji; and Satoh, Shuichi, 4,617,181, Cl. 423-446.000.

Satoh, Toshio; Miyataka, Hideki; Masamoto, Yukimitsu; Asai, Takashi; Hasegawa, Kenji; and Kakegawa, Hisao, to Sunstar Kabushiki Kaisha. Pharmaceutical compositions and method for inhibiting histamine release tocopheryl glycoside. 4,617,292, Cl. 514-27.000.

Satou, Hiroshi: *See*—
Miura, Hirohisa; Satou, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,617,055, Cl. 75-251.000.

Sauer, Heinz, to Rasmussen GmbH. Flexible pipe coupling. 4,616,858, Cl. 285-235.000.

Sausner, Andreas; and Ruschek, Gerhard, to VDO Adolf Schindling AG. Voltage supply. 4,617,505, Cl. 318-626.000.

Sauter, Hubert: *See*—
Eicken, Karl; Graf, Hermann; Gramlich, Walter; Sauter, Hubert; Rentzea, Costin; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, 4,617,303, Cl. 514-258.000.

Sauvestre, Jean-Claude: *See*—
Montier, Patrick; Sauvestre, Jean-Claude; Bethmann, Karl W.; Bisping, Bernhard; and Wallow, Peter, 4,616,569, Cl. 102-517.000.

Sawada, Kenji: *See*—
Koto, Haruhiko; Okada, Junichi; Ishii, Hiroshi; and Sawada, Kenji, 4,617,581, Cl. 346-140.00R.

Sawada, Satoru; and Ukai, Toshinao, to Fuji Photo Film Co., Ltd. Heat developable light-sensitive material. 4,617,257, Cl. 430-560.000.

Schafer, Doris; and Schafer, Rolf, to Alcon Laboratories, Inc. Sustained release drug delivery system utilizing bioadhesive polymers. 4,617,186, Cl. 424-78.000.

Schafer, Rolf: *See*—
Schafer, Doris; and Schafer, Rolf, 4,617,186, Cl. 424-78.000.

Schardt, Peter: *See*—
Bober, Helmut; Buthe, Theo; Coenen, Karl; Fartmann, Norbert; Herbertz, Klaus; Koch, Heinz; Kretschmer, Horst; Nienhaus, Clemens; Schardt, Peter; Schibrowski, Jurgen; and Schmandt, Willi, 4,617,003, Cl. 464-48.000.

Schenck, John F., to General Electric Company. Axial magnetic field gradient coil suitable for use with NMR apparatus. 4,617,516, Cl. 324-318.000.

Schering Corporation: *See*—
Girijavallabhan, Viyyoor M.; Ganguly, Ashit K.; Patel, Naginbhai; and Liu, Yi-Tsung, 4,617,300, Cl. 514-192.000.

Schibli, Thomas: *See*—
Munch, Otto; and Schibli, Thomas, 4,616,609, Cl. 123-196.0AB.

Schibrowski, Jurgen: *See*—
Bober, Helmut; Buthe, Theo; Coenen, Karl; Fartmann, Norbert; Herbertz, Klaus; Koch, Heinz; Kretschmer, Horst; Nienhaus, Clemens; Schardt, Peter; Schibrowski, Jurgen; and Schmandt, Willi, 4,617,003, Cl. 464-48.000.

Schield, John A.: *See*—
Naiman, Michael I.; and Schield, John A., 4,617,025, Cl. 44-62.000.

Schiff, Leonard N.: *See*—
Mangulis, Visvaldis; and Schiff, Leonard N., 4,617,674, Cl. 375-1.000.

Schiffer, Wilhelm: *See*—
Lugscheider, Walter; Mullner, Paul; Schiffer, Wilhelm; and Leutgob, Alois, 4,617,671, Cl. 373-22.000.

Schils, Petrus J. R., to Keystone International, Inc. Declutchable valve override. 4,616,803, Cl. 251-14.000.

Schindler, Hubert: *See*—
Rittner, Siegbert; Morach, Eugen; Schindler, Hubert; and John, Peter, 4,617,197, Cl. 427-180.000.

Schlafer, John D., to GTE Laboratories Incorporated. Methods of and apparatus for coupling an optoelectronic component to an optical fiber. 4,616,899, Cl. 350-96.180.

Schleich, Jean-Baptiste; Lahoda, Erwin; and Lickes, Jean-Paul, to Arbed S.A. Composite fire-resistant concrete/steel column or post. 4,616,464, Cl. 52-723.000.

Schleicher, Siegfried, to Ernst Stadelmann Gesellschaft m.b.H. Plastic Drawer. 4,616,892, Cl. 312-330.00R.

Schmandt, Willi: *See*—
Bober, Helmut; Buthe, Theo; Coenen, Karl; Fartmann, Norbert; Herbertz, Klaus; Koch, Heinz; Kretschmer, Horst; Nienhaus, Clemens; Schardt, Peter; Schibrowski, Jurgen; and Schmandt, Willi, 4,617,003, Cl. 464-48.000.

Schmid, Gerard: *See*—
Hubschwerlen, Christian N.; and Schmid, Gerard, 4,617,150, Cl. 540-364.000.

Schmid, Hans, to Megomat AG. Apparatus for cutting and preparing cables. 4,616,386, Cl. 29-33.00M.

Schmidt, Horst: *See*—
Heinzl, Burno; Frowein, Herbert; Stiegler, Hartmut; Wurz, Joachim; Schmidt, Horst; Huttel, Willi; and Schmitz, Karl-Heinz, 4,616,754, Cl. 211-71.000.

Schmidt, Michael R., to General Motors Corporation. Pressure relief and drain valve. 4,616,672, Cl. 137-107.000.

Schmidt, Peter-Jurgen: *See*—
Blocher, Eberhard; Grob, Ferdinand; Schmidt, Peter-Jurgen; and Wahl, Josef, 4,616,618, Cl. 123-478.000.

Schmitt, Susan M.: *See*—
Christensen, Burton G.; Cama, Lovji D.; and Schmitt, Susan M., 4,617,152, Cl. 540-200.000.

Schmitz, Karl-Heinz: *See*—
Heinzl, Burno; Frowein, Herbert; Stiegler, Hartmut; Wurz, Joachim; Schmidt, Horst; Huttel, Willi; and Schmitz, Karl-Heinz, 4,616,754, Cl. 211-71.000.

Schmodde, Hermann, to H. Stoll GmbH & Company. Single or multicam system for flat-bed knitting machines. 4,616,488, Cl. 66-70.000.

Schnur, Rodney C., to Pfizer Inc. Aldose reductase inhibiting 5-(2-alkoxyphenyl) thiazolidinediones. 4,617,312, Cl. 514-369.000.

Scholl, Hans, to Kochs Adler, AG. Upper feeding device of a sewing machine. 4,616,586, Cl. 112-320.000.

Schott, Wilhelm, to Jean Walterscheid GmbH. Shaft coupling lockable in the released position. 4,616,952, Cl. 403-316.000.

Schram, David N.: *See*—
Nobel, Fred I.; Ostrow, Barnet D.; and Schram, David N., 4,617,097, Cl. 204-44.400.

Schramm, Buford J. Hubless, hingeless and bearingless helicopter rotor system. 4,616,977, Cl. 416-138.000.

Schranz, Karl-Wilhelm: *See*—
Kunitz, Friedrich-Wilhelm; and Schranz, Karl-Wilhelm, 4,617,256, Cl. 430-557.000.

Schreiber, William L.; Narula, Anubhav P. S.; and Hanna, Marie R., to International Flavors & Fragrances Inc. 1-methyl-2(2-methylbutyl) cyclohexanol derivatives and organoleptic uses thereof. 4,617,145, Cl. 252-522.00R.

Schreiber, William L.: *See*—
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,617,144, Cl. 252-522.00A.

Schroeder, Jon M. Method for bonding electrical leads to electronic devices. 4,616,412, Cl. 29-827.000.

Schropp, Leopold: *See*—
Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,617,672, Cl. 373-79.000.

Schulte, Eric F.; and Lewis, Adam J., to Texas Instruments Incorporated. Configuration of a metal insulator semiconductor with a processor based gate. 4,616,403, Cl. 29-572.000.

Schulte, Gunter: *See*—
Hornung, Klaus; Alt, Anton; Schulte, Gunter; and Mahnig, Fritz, 4,617,069, Cl. 148-138.000.

Schulte, Hans-Gerd, to Krupp Polysius AG. Method and apparatus for the heat treatment of fine-grained material. 4,616,575, Cl. 110-345.000.

Schumacher, Heinz O. System for continuous solid/liquid extraction. 4,617,177, Cl. 422-273.000.

Schupack, Morris. Three dimensionally reinforced fabric concrete. 4,617,219, Cl. 428-113.000.

Schwab, Gerhart; Lee, Mei-Tsu; and Bentley, James W., to Mead Corporation, The. Electrochemical bleaching of wood pulps. 4,617,099, Cl. 204-133.000.

Schwaighofer, Helmut: *See*—
Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,617,672, Cl. 373-79.000.

Schwarz, Theodor: *See*—
Caspar, Wolfhard; Lutze, Theodor; and Schwarz, Theodor, 4,616,635, Cl. 128-20.000.

Schwarzkopf, Eugen, to Hotset Heizpatronen und Zubehor GmbH. Electrical heating cartridge. 4,617,455, Cl. 219-523.000.
Schweitzer, David C., to General Motor Corporation. Adjustment mechanism. 4,616,906, Cl. 350-486.000.
Schwochert, Hans-Joachim: *See—*
Giese, Peter; Holzmann, Rainer; Schwochert, Hans-Joachim; and Thomas, Alfred, 4,617,077, Cl. 156-245.000.
Schwolsky, Peter M.: *See—*
Kaali, Steven; Schwolsky, Peter M.; and Porter, Joseph W., 4,616,640, Cl. 128-130.000.
Scott, Bruce D.; and Watkins, James W., to Celanese Corporation. Radiation curable abrasion resistant coatings for plastics. 4,617,194, Cl. 427-54.100.
Scott, Charles G.; and Harris, Robert L., to Plantronics, Inc. Voice tube assemblies for post-auricle headsets. 4,617,431, Cl. 179-156.00A.
Scott, Russell L. Moveable clamp and edge sealing method employing same. 4,617,073, Cl. 156-107.000.
Scourtes, Constantine C.; and Doerfling, Ralph A. Swimming pool bond beam form system. 4,616,800, Cl. 249-4.000.
Seco/Warwick Corporation: *See—*
Ross, Robert H., 4,616,997, Cl. 432-148.000.
Second Chance Systems, Inc.: *See—*
Brown, Kenneth A., 4,617,561, Cl. 340-628.000.
Sederel, Willem L., to General Electric Company. Polymer mixture which comprises an aromatic polycarbonate resin and an impact strength-improving agent. 4,617,345, Cl. 525-67.000.
Sedlmayr, Gerhard, to Autoflug GmbH. Automatic height adjustment device. 4,616,850, Cl. 280-808.000.
See, Jackie R.: *See—*
Shell, William; and See, Jackie R., 4,616,658, Cl. 128-691.000.
Seeq Technology, Inc.: *See—*
Ip, William W.; and Perlegos, Gust, 4,617,651, Cl. 365-200.000.
Sehlmeyer, Trannie R.: *See—*
Grimm, Michael J.; and Sehlmeyer, Trannie R., 4,617,111, Cl. 209-4.000.
Seib, Karl: *See—*
Hoppe, Udo; Seib, Karl; Naegele, Paul; and Martin, Roland, 4,617,390, Cl. 544-197.000.
Seidman, Martin: *See—*
Kiely, Donald E.; and Seidman, Martin, 4,617,405, Cl. 549-262.000.
Seido, Mitsuro. Tissue paper box. 4,616,767, Cl. 221-58.000.
Seiko Epson Kabushiki Kaisha: *See—*
Fujiwara, Hitoshi; and Futagawa, Yoshikiyo, 4,617,563, Cl. 340-784.000.
Seiko Instruments & Electronics Ltd.: *See—*
Kamamori, Hitoshi; Suginoya, Mitsuru; Iwasa, Koji; Sano, Yutaka; and Terada, Yumiko, 4,617,094, Cl. 204-18.100.
Seiko Seiki Kabushiki Kaisha: *See—*
Nagata, Tetsuya, 4,616,448, Cl. 51-215.00H.
Seiler, Wayne H., to Ford Motor Company. Automotive type fuel feed system. 4,617,116, Cl. 210-137.000.
Sekino, Mitsuru: *See—*
Hiroshima, Minoru; Matsumoto, Shinzo; Sekino, Mitsuru; and Taniguchi, Yoshinori, 4,617,644, Cl. 365-36.000.
Sekiya, Toshiyuki: *See—*
Nakakita, Eiji; Koike, Akinobu; Sekiya, Toshiyuki; Misu, Hiroshi; and Kita, Nobuyuki, 4,617,250, Cl. 430-175.000.
Sekmakas, Kazys; and Shah, Raj, to DeSoto, Inc. Wet adhesion promoters for emulsion polymers. 4,617,364, Cl. 526-263.000.
Seligman, Marvin: *See—*
Lowell, Ross; Seligman, Marvin; and Calamai, Edward, 4,616,384, Cl. 24-335.000.
Semien, Garland J., Jr.: *See—*
Smack, Melvin F., Sr.; and Semien, Garland J., Jr., 4,616,829, Cl. 273-86.00B.
Senda, Kenichi; Ando, Masao; Nakamura, Kyoichi; and Nishida, Tatehiko, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Pre-expanded particle of non-crosslinked linear low density polyethylene. 4,617,322, Cl. 521-60.000.
Senez, Claude: *See—*
Laine, Antoine; and Senez, Claude, 4,617,341, Cl. 524-591.000.
Senftle, Joseph T.; and Larter, Stephen R., to Union Oil Company of California. Apparatus for characterizing kerogens. 4,617,467, Cl. 250-461.100.
Senkingwerk GmbH: *See—*
Stoll, Karl-Heinz, 4,616,372, Cl. 8-158.000.
Septier, Louis: *See—*
Demange, Michel; and Septier, Louis, 4,616,690, Cl. 164-128.000.
Serge, Ladriere. Projectiles intended to be fired by a fire-arm. 4,616,568, Cl. 102-501.000.
Sermatech International, Inc.: *See—*
Mosser, Mark F.; and McMordie, Bruce G., 4,617,056, Cl. 106-1.120.
Seroteknik HG: *See—*
Ohlin, L. Erik; Unger, H. Peter; and Westberg, J. Eric, 4,617,009, Cl. 494-21.000.
Serrano, Jean-Pierre; and Feuillerat, Jean, to Societe Nationale Industrielle Aerospatiale. Process and device for injecting a finely divided material into a hot gaseous flow and apparatus for carrying out this process. 4,616,779, Cl. 239-79.000.
Setoguchi, Michihide: *See—*
Tahara, Tetsuya; Hayano, Kiyoharu; Setoguchi, Michihide; and Fukuda, Takemi, 4,617,314, Cl. 514-422.000.
Setoguchi, Ryoichi: *See—*
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Sevrin, Mireille: *See—*
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Seyfried, Christoph: *See—*
Bottcher, Henning; Gottschlich, Rudolf; Hausberg, Hans-Heinrich; Seyfried, Christoph; and Minck, Klaus-Otto, 4,617,309, Cl. 514-339.000.
Seymour, Charles S.: *See—*
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Seymour Manufacturing Company: *See—*
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Shaar, Carl J.: *See—*
DiMarchi, Richard D.; and Shaar, Carl J., 4,617,149, Cl. 530-324.000.
Shaftel, Myles A., to Kennecott Corporation. Electrode probe assembly for glass lined metal vessels. 4,617,511, Cl. 324-54.000.
Shah, Pravinchandra K.; and Antlfinger, George J., to B. F. Goodrich Company, The. Latex containing odor inhibitor. 4,617,230, Cl. 428-288.000.
Shah, Raj: *See—*
Sekmakas, Kazys; and Shah, Raj, 4,617,364, Cl. 526-263.000.
Shak, Peter J.; and Ho, Roland K., to Motorola, Inc. Capacitive pressure transducer. 4,617,606, Cl. 361-283.000.
Shaner, Jay R.: *See—*
Joo, Louis A.; Tucker, Kenneth W.; and Shaner, Jay R., 4,617,053, Cl. 75-244.000.
Shanley, James J.: *See—*
Lake, Carole J.; Shanley, James J.; and Silverstein, Steven M., 4,617,663, Cl. 371-25.000.
Shanley, Robert L., II, to RCA Corporation. Recovery system for a control loop. 4,617,587, Cl. 358-17.000.
Sharp Kabushiki Kaisha: *See—*
Ikezaki, Katsuji; and Ishii, Kiyoshi, 4,617,034, Cl. 55-276.000.
Itoigawa, Masakatsu; and Nishijima, Masaru, 4,616,920, Cl. 355-3.0BE.
Katoh, Tutomu, 4,616,765, Cl. 220-335.000.
Morino, Masuaki; and Takada, Yuji, 4,617,650, Cl. 365-195.000.
Shattuck, Thomas G. Blade adjustment device for sod cutting machine. 4,616,713, Cl. 172-19.000.
Shaub, Harold; and Waddey, Walter E., to Exxon Research and Engineering Company. Method for improving the fuel economy of an internal combustion engine using fuel having hydroxyl-containing ester additive. 4,617,026, Cl. 44-70.000.
Shaub, Harold, to Exxon Research and Engineering Company. Method and lubricant composition for providing improved friction reduction. 4,617,134, Cl. 252-32.70E.
Shaw, Richard G.; and Fahrer, Theodore J., to Erico International Corporation. Control circuit and method for stud welding gun lifting solenoid. 4,617,445, Cl. 219-98.000.
Sheiman, Arthur E., to Data Distribution Devices, Inc. Receiver for audible alarm. 4,617,555, Cl. 340-531.000.
Sheldon, Edward L., III; Levenson, Corey H.; Mullis, Kary B.; Rapoport, Henry; and Watson, Robert M., to Cetus Corporation. Process for labeling nucleic acids and hybridization probes. 4,617,261, Cl. 435-6.000.
Shell Oil Company: *See—*
da Mota, Augusto L. C., 4,616,708, Cl. 166-355.000.
Hemphill, Dean P., 4,616,956, Cl. 405-158.000.
Langner, Carl G., 4,616,707, Cl. 166-345.000.
Stegemeier, George L.; Van Meurs, Peter; and Van Egmond, Cor F. H., 4,616,705, Cl. 166-250.000.
Shell, William; and See, Jackie R. Non-radioactively labeled microspheres and use of same to measure blood flow. 4,616,658, Cl. 128-691.000.
Shephard, Kevin E., to J. & K. Shephard Design Pty Limited. Tactical dinghy compass. 4,616,423, Cl. 33-355.00R.
Sheppard, Isaac, Jr.; Jewell, Everett; Levitz, Steven E.; and Taylor, Rudolph T. Light gauge steel building system. 4,616,453, Cl. 52-93.000.
Sherrill, Jimmy L.: *See—*
Howard, H. Keith; Sherrill, Jimmy L.; and Kirby, Robert L., 4,617,547, Cl. 338-317.000.
Sherwin, Robert M.: *See—*
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Sherwood Medical Company: *See—*
Fecht, David C.; and Davison, Thomas W., 4,617,019, Cl. 604-280.000.
Shibanai, Ichiro. Process for preparation of solid perfumes. 4,617,147, Cl. 252-522.00A.
Shibata, Kiyoshi: *See—*
Kimura, Hiroshi; Hisajima, Masahiko; Shibata, Kiyoshi; and Morimoto, Kiyoshi, 4,616,924, Cl. 355-15.000.
Shibata, Shinichi: *See—*
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Shibuya Kogyo Co., Ltd.: *See—*
Tanaka, Hideo; and Muranaka, Shiaru, 4,616,466, Cl. 53-75.000.
Shibuya, Toshifumi: *See—*
Noguchi, Takaharu; Kobayashi, Masaharu; Arai, Takao; and Shibuya, Toshifumi, 4,617,599, Cl. 360-32.000.
Shidara, Keiichi: *See—*
Tanioka, Kenkichi; Shidara, Keiichi; Kuriyama, Takao; Takasaki, Yukio; Hirai, Tadaaki; Nonaka, Yasuhiko; and Inoue, Eisuke, 4,617,248, Cl. 430-95.000.

Shields, Susan J., to Hercules Incorporated. Opaque liquid hand soap. 4,617,148, Cl. 252-547.000.
Shiga, Mitsuo, to Honda Giken Kogyo Kabushiki Kaisha. Balancer device for a reciprocating engine. 4,616,608, Cl. 123-192.00B.
Shigeki, Terumitsu: *See—*
Asano, Tetsuji; Kodama, Keiichi; and Shigeki, Terumitsu, 4,617,213, Cl. 428-36.000.
Shimada, Takeo: *See—*
Oonishi, Akiyoshi; Doi, Shuhei; and Shimada, Takeo, 4,617,365, Cl. 526-265.000.
Shimano, Akira: *See—*
Matsui, Isamu; Uchida, Hiroshi; Nakanishi, Kazuo; and Shimano, Akira, 4,616,789, Cl. 242-35.50R.
Shimano Industrial Company Limited: *See—*
Nagano, Masashi, 4,617,006, Cl. 474-80.000.
Shimazaki, Takashi: *See—*
Kohyama, Mitsuaki; and Shimazaki, Takashi, 4,616,918, Cl. 355-3.0DD.
Shimizu, Katsuichi: *See—*
Yoshida, Tadashi; Shimizu, Katsuichi; Arimoto, Shinobu; Maeshima, Katsuyoshi; Nagashima, Nao; and Watanabe, Asao, 4,617,596, Cl. 358-280.000.
Shimizu, Yutaka, to Mitsubishi Denki K.K. Numerical control machining system. 4,617,635, Cl. 364-474.000.
Shimojima, Yoji: *See—*
Tokunaga, Ichiro; Matsunaga, Hiroshi; and Shimojima, Yoji, 4,617,460, Cl. 250-227.000.
Shimomura, Hiroshi: *See—*
Ushijima, Hiroyuki; Shimomura, Hiroshi; and Nakayama, Masaaki, 4,616,962, Cl. 407-113.000.
Shimotsuma, Wataru: *See—*
Hosaka, Tomiharu; Kishimoto, Yoshio; and Shimotsuma, Wataru, 4,617,356, Cl. 525-429.000.
Shin-Etsu Chemical Co., Ltd.: *See—*
Okada, Fumio; Oba, Toshio; Nakazato, Morizo; and Isobe, Kenichi, 4,617,335, Cl. 524-265.000.
Takahashi, Masaharu; Tokushige, Yuji; and Itoh, Kunio, 4,617,078, Cl. 156-307.500.
Tanaka, Masaki; and Ohashi, Hiroshi, 4,617,340, Cl. 524-588.000.
Tanaka, Masaki; and Ohashi, Hiroshi, 4,617,344, Cl. 524-837.000.
Shindo, Masahiro: *See—*
Kyomasu, Mikio; Araki, Toshiyuki; Fukunaga, Shinobu; and Shindo, Masahiro, 4,617,649, Cl. 365-189.000.
Shinkai, Etsuro: *See—*
Matsuda, Noriaki; and Shinkai, Etsuro, 4,617,275, Cl. 436-10.000.
Shinmei Rubber Ind., Co., Ltd.: *See—*
Hoshikawa, Kyofu; Ishiwatari, Seishiro; and Tanahashi, Mitsuru, 4,617,433, Cl. 200-86.00R.
Shinohe, Takashi; and Asaka, Masayuki, to Kabushiki Kaisha Toshiba. Gate turn-off thyristor. 4,617,583, Cl. 357-38.000.
Shinonome, Osami; Ikeda, Takasi; Kanmuri, Yoshihiro; and Matuoka, Fumio, to Unitika Ltd. Antistatic synthetic fibers. 4,617,235, Cl. 428-374.000.
Shiotsu, Osamu: *See—*
Nakata, Yukio; Suda, Kaoru; Shiotsu, Osamu; and Morito, Motoyoshi, 4,617,565, Cl. 340-825.500.
Shiraishi, Hisashi; Kato, Hisatoyo; and Miyahara, Junji, to Fuji Photo Film Co., Ltd. Stimulable phosphor sheet with hydrophilic surface. 4,617,468, Cl. 250-484.100.
Shiraishi, Makoto: *See—*
Maruyama, Hitoshi; Kajitani, Koichi; and Shiraishi, Makoto, 4,617,239, Cl. 428-452.000.
Shiue, Chyng-Yann: *See—*
Elmaleh, David R.; Levy, Shlomo; Shiue, Chyng-Yann; and Wolf, Alfred P., 4,617,386, Cl. 536-122.000.
Shokestu Kinzoku Kogyo Kabushiki Kaisha: *See—*
Oneyama, Naotake; and Yoshikawa, Akihisa, 4,616,476, Cl. 60-414.000.
Shollenbarger, David W.: *See—*
Duffy, John W.; Funke, Robert A.; and Shollenbarger, David W., 4,616,670, Cl. 137-84.000.
Shop-Vac Corporation: *See—*
Berfield, Robert C.; and Crevling, Robert, 4,616,378, Cl. 15-353.000.
Shouse, George K., to Shouse, George K.; and Newsome, Joe B. Eaves trough/rain gutter shield. 4,616,450, Cl. 52-12.000.
Showa Denko Kabushiki Kaisha: *See—*
Miyauchi, Otohiko; Ohkawachi, Michihiro; and Yotsuyanagi, Junji, 4,616,766, Cl. 220-450.000.
Shubow, Calvin. Building construction using hollow core wall. 4,616,459, Cl. 52-309.120.
Shurtliff, Norval E. Damped boring bar and tool holder. 4,616,738, Cl. 188-380.000.
Shyr, Yen-Shin; and Johnson, Marvin M., to Phillips Petroleum Company. Process for cracking with silica-alumina. 4,617,108, Cl. 208-111.000.
Sibley, Henry C.: *See—*
Auer, John H., Jr.; Sibley, Henry C.; and Stewart, Leslie C., 4,617,662, Cl. 371-25.000.
Siekmann, Helmut E.; Bassler, Jurgen; and Liebig, Winfried, to Uhde GmbH; and Siekmann, Helmut E. Process and equipment, in particular for the conditioning of waste water sludges. 4,617,130, Cl. 210-748.000.
Siemens Aktiengesellschaft: *See—*
Cewers, Goeran; Johansson, Jan; and Olsson, Sven-Gunnar, 4,616,801, Cl. 251-6.000.
Dolansky, Franz; and Steiner, Ewald, 4,617,602, Cl. 361-119.000.
Nossek, Josef A., 4,617,537, Cl. 332-48.000.
Ophoff, Paul A., 4,617,551, Cl. 340-347.0DA.
Paulik, Ernst, 4,617,533, Cl. 331-113.00A.
Reiner, Robert, 4,617,549, Cl. 340-347.0AD.
Reinhardt, Hans-Juergen, 4,617,513, Cl. 324-126.000.
Utner, Ferdinand; and Bolz, Herbert, 4,617,609, Cl. 361-310.000.
Zuckler, Karl, 4,617,434, Cl. 200-144.00B.
Siemens Elema AB: *See—*
Cewers, Goeran; Johansson, Jan; and Olsson, Sven-Gunnar, 4,616,801, Cl. 251-6.000.
Sikorcin, John: *See—*
Malinski, Richard F.; and Sikorcin, John, 4,616,528, Cl. 74-626.000.
Silcox, William H.: *See—*
Suh, Sung L.; Reeds, Carter B.; Van Scherpe, Peter; and Silcox, William H., 4,617,031, Cl. 55-52.000.
Silverstein, Steven M.: *See—*
Lake, Carole J.; Shanley, James J.; and Silverstein, Steven M., 4,617,663, Cl. 371-25.000.
Simko, Richard T., to Xicor, Inc. Integrated high voltage distribution and control systems. 4,617,652, Cl. 365-203.000.
Simmons, Eugene D.; Thomson, Graham C., III; and Reynaud, Richard J. Pumping apparatus with a down-hale spring loaded piston actuated by fluid pressure. 4,616,981, Cl. 417-378.000.
Simmons, Harold C.; and Harding, Curtis F., to Parker Hannifin Corporation. Slurry atomizer. 4,616,784, Cl. 239-404.000.
Simonetti, Jean-Pierre, to Outillages Scientifiques et de Laboratoires O.S.L. S.A. Translatable soldering machine. 4,616,775, Cl. 228-37.000.
Simons, Raymond G.: *See—*
Stein, Ray J.; and Simons, Raymond G., 4,617,157, Cl. 261-96.000.
Simpkins, James W.: *See—*
Bodor, Nicholas S.; Estes, Kerry S.; and Simpkins, James W., 4,617,298, Cl. 514-176.000.
Simpson, Jay R.: *See—*
MacChesney, John B.; Simpson, Jay R.; and Walker, Kenneth L., 4,616,901, Cl. 350-96.340.
Simpson, John B., to Devices for Vascular Intervention. Device facilitating the exchange of dilatation catheters during an angioplasty procedure. 4,616,648, Cl. 128-303.00R.
Simpson, John B., to Advanced Cardiovascular Systems, Inc. Dilatation catheter positioning apparatus. 4,616,652, Cl. 128-344.000.
Singer Company, The: *See—*
Vartoukian, Artin G.; and Haggerty, Robert P., 4,616,584, Cl. 112-121.150.
Singh, Avtar: *See—*
Nath, Prem; Izu, Masatsugu; Ovshinsky, Herbert C.; and Singh, Avtar, 4,617,421, Cl. 136-244.000.
Singh, Shobha: *See—*
Chin, Aland K.; Singh, Shobha; Uitert, LeGrand G. V.; and Zydzik, George J., 4,617,192, Cl. 427-42.000.
Single Buoy Moorings, Inc.: *See—*
Girardot, Michel; and Poldervaart, Leendert, 4,617,000, Cl. 441-3.000.
Sinkkila, Aarre. Forest mattock with braked rotation system. 4,616,715, Cl. 172-61.000.
Siska, Margaret M.: *See—*
Wood, John R.; Siska, Margaret M.; and Raymond, Patrick A., 4,616,700, Cl. 166-250.000.
Sitnai, Oto: *See—*
Mandelson, John; McCarthy, David J.; Sitnai, Oto; and Whitehead, Alan B., 4,617,107, Cl. 208-427.000.
Sizensky, Joseph J., to Olin Hunt Specialty Products, Inc. Stripping composition and method of using the same. 4,617,251, Cl. 430-256.000.
Sizer, Theodore, II: *See—*
Mourou, Gerard; Norris, Theodore B.; and Sizer, Theodore, II, 4,617,665, Cl. 372-18.000.
Skalleberg, Oystein, to Skaltek AB. Method for producing a package. 4,616,469, Cl. 53-410.000.
Skaltek AB: *See—*
Skalleberg, Oystein, 4,616,469, Cl. 53-410.000.
Skardal, Karl A. Vortex cleaner for cleaning and deaerating paper pulp suspensions. 4,617,114, Cl. 209-211.000.
Skis Rossignol S.A.-Club Rossignol S.A.: *See—*
Echevin, Michel; Piegay, Yves; and Legrand, Maurice, 4,616,842, Cl. 280-602.000.
Slaats, Mathew A.; and Blesinger, James E., to Kimball International, Inc. Chair with back height adjustment. 4,616,877, Cl. 297-353.000.
Slansky, Allan. Operator alarm system. 4,617,559, Cl. 340-576.000.
Slavik, William H., to Nuvatec, Inc. Recreational vehicle power control system. 4,617,472, Cl. 307-10.00R.
Slee, Roger H., to AE PLC. Manufacture of camshafts. 4,616,389, Cl. 29-156.40R.
Sloboda, Adolph E.: *See—*
Kerwar, Suresh S.; Sloboda, Adolph E.; and Ridge, Susan C., 4,617,319, Cl. 514-647.000.
Sluga, Thomas J.: *See—*
Rollins, Richard A.; Sluga, Thomas J.; and Tobiasz, Henry, 4,617,161, Cl. 264-136.000.
Smack, Melvin F., Sr.; and Semien, Garland J., Jr., to World Inventions. Apparatus for simulating running games. 4,616,829, Cl. 273-86.00B.
Smart, Michael F., to Fram Industrial Ltd. Assemblies of conjoined parts. 4,617,118, Cl. 210-232.000.

Smeenge, Paul A.; Wilson, Harold R.; and Nelsen, Randy P., to Haworth, Inc. Adjustable support for CRT keyboard. 4,616,798, Cl. 248-281.100.

Smith, Franklin W., to Gieser, John D.; and Foreman, Douglas. Control and safety system for electrically powered submersible tools and lights. 4,617,501, Cl. 318-459.000.

Smith, Graham: *See—*
Green, David T.; McGarry, Richard A.; and Smith, Graham, 4,616,650, Cl. 128-325.000.

Smith International, Inc.: *See—*
Anderson, George F., 4,617,446, Cl. 219-121.0LC.
Furse, John H., 4,616,721, Cl. 175-320.000.

Smith, John M.: *See—*
Harwood-Nash, Derek C.; Fitz, Charles R.; Zouch, Edward T.; and Smith, John M., 4,616,814, Cl. 269-328.000.

Smith, Joseph E., Jr., to O & S Manufacturing Company. Method of manufacturing spherical and cylindrical bearings. 4,616,387, Cl. 29-149.50B.

Smith, Lloyd S.: *See—*
Bunch, Richard P.; and Smith, Lloyd S., 4,616,432, Cl. 36-50.000.

Smith, Peter J., to Imperial Chemical Industries PLC. Production of ion-exchange membrane. 4,617,163, Cl. 264-235.600.

Smith, Robert A., to Goodyear Tire & Rubber Company, The. High molecular weight polyacrylamide synthesis. 4,617,359, Cl. 526-93.000.

Smith, William N., III: *See—*
Dickerson, James W.; and Smith, William N., III, 4,617,423, Cl. 178-2.00R.

Snouse, Thomas W.: *See—*
Faria, Carl R.; and Snouse, Thomas W., 4,616,860, Cl. 285-336.000.

Snyder, David A., to Westinghouse Electric Corp. Bladder mandrel for hydraulic expansions of tubes and sleeves. 4,616,392, Cl. 29-283.500.

Sobieski, James F.; and Muehlhausen, Robert A., to Minnesota Mining and Manufacturing Company. Electrophotographic copying apparatus and process. 4,616,922, Cl. 355-14.00R.

Societe Chimique Des Charbonnages, S.A.: *See—*
Gloriod, Pierre; Audureau, Joel; and Pellegrini, Maurice, 4,617,366, Cl. 526-272.000.

Societe Francaise d'Electrometallurgie-SOFREM: *See—*
Demange, Michel; and Septier, Louis, 4,616,690, Cl. 164-128.000.

Societe Nationale Elf Aquitaine: *See—*
Belouet, Christian, 4,616,595, Cl. 118-405.000.

Societe Nationale Industrielle Aerospatiale: *See—*
Serrano, Jean-Pierre; and Feuillerat, Jean, 4,616,779, Cl. 239-79.000.

Societe Technique d'Applicatioon et de Recherche Electronique: *See—*
Choquer, Jean; and Gartner, Thierry, 4,617,571, Cl. 343-744.000.

Society Nationale Industrielle Aerospatiale: *See—*
Michaud-Soret, Jean A., 4,617,217, Cl. 428-71.000.

Solt, Wayne J. Apparatus for injecting liquid manure into the ground. 4,616,579, Cl. 111-7.000.

Solvay & Cie.: *See—*
Bienfait, Charles, 4,617,360, Cl. 526-114.000.

Somers, Gerardus H. J., to U.S. Philips Corporation. Magnetic head having a thin strip of magnetoresistive material as a reading element. 4,617,600, Cl. 360-113.000.

Someya, Hiromi; Aihara, Yoshihiko; Suzuki, Nobuyuki; and Mizogui, Toyokazu, to Canon Kabushiki Kaisha. Exposure control mode selecting device for camera. 4,616,916, Cl. 354-442.000.

Sommer Co.: *See—*
Sommer, Gordon M., 4,616,739, Cl. 192-18.00A.

Sommer, Gordon M., to Sommer Co. Inching drive. 4,616,739, Cl. 192-18.00A.

Sone, Takehiko; Takoshima, Takehiro; and Kamijyo, Yoshimi, to Alps Electric Co., Ltd. Piezoelectric elastic surface wave element with film of tantalum pentoxide or silicon nitride. 4,617,487, Cl. 310-313.00D.

Sonoda, Nobuharu, to Mitsubishi Gas Chemical Company, Inc. Polyphenylene ether resin composition. 4,617,346, Cl. 525-68.000.

Sony Corporation: *See—*
Katagiri, Koichi; Hanamoto, Yoshihiro; Maeda, Satoru; and Taniguchi, Ikuo, 4,617,594, Cl. 358-150.000.
Kobayashi, Youichi; and Murakami, Susumu, 4,617,080, Cl. 156-359.000.
Kojima, Yuichi; and Fukuda, Shinichi, 4,617,552, Cl. 340-347.0DD.
Suzuki, Kiyosuke; Fukuma, Toshiaki; and Sato, Tatsuru, 4,617,247, Cl. 430-81.000.
Yussa, Masami, 4,617,499, Cl. 318-254.000.

Souchik, Nicholas, Jr. Wind driven turbine. 4,616,973, Cl. 415-2.00R.

Soucy, Francis L.: *See—*
Matson, Gary R.; Pottle, Winston G.; and Soucy, Francis L., 4,616,921, Cl. 355-5.000.

Soum, Jacques; and Malabre, Christian, to ABG Semca. Process for producing a hydrodynamic bearing having internal foil cartridge. 4,616,388, Cl. 29-149.50S.

Sovonics Solar Systems: *See—*
Nath, Prem; Izu, Masatsugu; Ovshinsky, Herbert C.; and Singh, Avtar, 4,617,421, Cl. 136-244.000.

Spacesaver Corporation: *See—*
Peterman, Robert J., 4,616,888, Cl. 312-201.000.
Peterman, Robert J., 4,616,889, Cl. 312-201.000.

Specialty Products, Inc.: *See—*
Pettibone, Craig R., 4,616,845, Cl. 280-661.000.

Speranza, Donald, to Eaton Corporation. DC to DC converter with self-starting flyback oscillator. 4,617,620, Cl. 363-19.000.

Spietschka, Ernst; and Urban, Manfred, to Hoechst Aktiengesellschaft. Process for preparing a pigment based on 4,4',7,7'-tetrachlorothioindigo. 4,617,403, Cl. 549-56.000.

Spink, Thomas E.; and Rushing, Frank C., to Westinghouse Electric Corp. Extendable tube for vertically delivered weapons. 4,616,554, Cl. 89-1.806.

Sprague, Richard P., to First Byte. Compaction method for waveform storage. 4,617,645, Cl. 365-45.000.

Spurlock, Kim E.: *See—*
Giaier, Thomas A.; Johnson, Neil H.; Reschly, David C.; Knox, Harold L.; and Spurlock, Kim E., 4,616,573, Cl. 110-327.000.

Srnka, Leonard J., to Exxon Production Research Co. Method and apparatus for offshore electromagnetic sounding utilizing wavelength effects to determine optimum source and detector positions. 4,617,518, Cl. 324-365.000.

Staker, William C.: *See—*
Frey, Mark W.; King, Dallas E.; and Staker, William C., 4,616,527, Cl. 74-625.000.

Standard Oil Company, The: *See—*
Dilts, David A.; and Brauneck, Timothy W., 4,617,420, Cl. 136-244.000.

Standard Oil Company (Indiana): *See—*
Tolpin, Thomas W.; and Kretchmer, Richard A., 4,617,175, Cl. 422-171.000.

Staniak, Waldema A.; Samuelson, Robert E.; and Moncelle, Michael E., to Caterpillar Inc. Fuel control system. 4,616,616, Cl. 123-357.000.

Stanton, Paul N.: *See—*
Huffaker, Roger W.; and Stanton, Paul N., 4,616,706, Cl. 166-341.000.

Stark, Eduard: *See—*
Bach, Lars; and Stark, Eduard, 4,616,991, Cl. 425-396.000.

Stauber, Hans-Ulrich, to Ferag AG. Apparatus for superposing flexible flat structures, especially sheets and signatures, and method of using such apparatus. 4,616,816, Cl. 270-58.000.

Stauffer Chemical Company: *See—*
Liu, Sophia Y., 4,617,328, Cl. 523-122.000.

Ste. Francaise d'Equipements pour la Navigation Aerienne: *See—*
Bernelin, Bernard; and de Salaberry, Bernard, 4,616,929, Cl. 356-350.000.

Stegemeier, George L.; Van Meurs, Peter; and Van Egmond, Cor F. H., to Shell Oil Company. Mini-well temperature profiling process. 4,616,705, Cl. 166-250.000.

Steigler, Pamela S.: *See—*
Steigler, Thomas F.; and Steigler, Pamela S., 4,616,769, Cl. 223-46.000.

Steigler, Thomas F.; and Steigler, Pamela S. Doll hair maker and method of use. 4,616,769, Cl. 223-46.000.

Stein, Ray J.; and Simons, Raymond G., to Whirlpool Corporation. Fragrance dispenser for room air conditioner. 4,617,157, Cl. 261-96.000.

Steinberg, David H.; and Cortolano, Frank, to Ciba-Geigy Corporation. Process for preparing stabilizers containing sulfur and a hindered phenol group. 4,617,404, Cl. 549-90.000.

Steiner, Ewald: *See—*
Dolansky, Franz; and Steiner, Ewald, 4,617,602, Cl. 361-119.000.

Steiniger, Wolfgang: *See—*
Lorenzen, Heinz-Christen; Heitmann, Uwe; and Steiniger, Wolfgang, 4,616,663, Cl. 131-109.300.

Steinkuhl, Allan R.; and Cayton, Steven D., to TRW Inc. Valve with flow force compensator. 4,616,671, Cl. 137-101.000.

Stetter GmbH: *See—*
Riker, Rudolf, 4,616,786, Cl. 241-35.000.

Stewart, James E.: *See—*
Menlove, Howard O.; and Stewart, James E., 4,617,466, Cl. 250-390.000.

Stewart, Leslie C.: *See—*
Auer, John H., Jr.; Sibley, Henry C.; and Stewart, Leslie C., 4,617,662, Cl. 371-25.000.

Stickler, David B., to Gas Research Institute. Method for the heat processing of glass and glass forming material. 4,617,042, Cl. 65-27.000.

Stiegler, Hartmut: *See—*
Heinzl, Burno; Frowein, Herbert; Stiegler, Hartmut; Wurz, Joachim; Schmidt, Horst; Huttel, Willi; and Schmitz, Karl-Heinz, 4,616,754, Cl. 211-71.000.

Stockel, Richard F.; and Dumas, Philip E. Use of selenium-containing compounds for negating the toxic effects of platinum compounds used in chemotherapy, and a novel selenium-containing platinum compound and use thereof as an anti-cancer medicine. 4,617,189, Cl. 424-162.000.

Stokoe, Philip T.; Cleaver, Glenn N.; and Boulais, Dennis R., to Augat Inc. High speed lead socket assembly machine. 4,616,410, Cl. 29-743.000.

Stoll, Karl-Heinz, to Senkingwerk GmbH. Method of operating counter flow cycling washing machine. 4,616,372, Cl. 8-158.000.

Stoller, Milton, to First National Bank of Boston, The. Diaphanoscopy apparatus. 4,616,657, Cl. 128-664.000.

Storalene AB: *See—*
Larsson, Leif; and Ekdahl, Bengt, 4,617,229, Cl. 428-284.000.

Stout, Gregg W.; and Myers, William D., Jr., to Baker Oil Tools, Inc. Well perforating apparatus including an underbalancing valve. 4,616,701, Cl. 166-55.100.

Stout, Michael E.; Peacock, Bobbie; and Lindroos, Jarl, to M.A. Industries, Inc. Thermal gravity classifying apparatus and method. 4,617,112, Cl. 209-11.000.

Strang, Virgil G. Arc welding filter. 4,617,033, Cl. 55-100.000.

Strehler, Richard; and Babisch, Guenter, to Carl Hurth Maschinen und Zahnradfabrik GmbH & Co. Control chain connection. 4,616,730, Cl. 180-253.000.
Stricker, Alfred A.: *See—*
Bleau, Charles D.; Gasper, Andrew, Jr.; Perlini, Julius J.; and Stricker, Alfred A., 4,617,081, Cl. 156-443.000.
Stritzl, Karl: *See—*
Freisinger, Henry; Luschnig, Franz; Stritzl, Karl; and Zotter, Johann, 4,616,843, Cl. 280-618.000.
Strommer, Erich, to Novophalt Societe Anonyme. Method for producing a synthetic material-containing powder. 4,617,201, Cl. 427-216.000.
Studer, Urs-Peter, to Zumbach Electronic AG. Process and device for the contact free determination of the movement of an object. 4,616,931, Cl. 356-373.000.
Stumpe, Werner: *See—*
Muller, Egbert; Grauel, Ingolf; and Stumpe, Werner, 4,616,881, Cl. 303-7.000.
Su, Aaron C. L., to Du Pont de Nemours, E. I., and Company. ω-perfluoroalkyl-α-olefin polymers. 4,617,363, Cl. 526-253.000.
Subbarao, Wunnava V.; and Ely, Richard I., to Burroughs Corporation. Fluorescent optical switch and keyboard apparatus. 4,617,461, Cl. 250-229.000.
Suchdeo, Shyam R.; Patel, Suresh U.; and Harris, Christopher F., to Air Products and Chemicals, Inc. Tonnage nitrogen air separation with side reboiler condenser. 4,617,036, Cl. 62-11.000.
Suchy, Peter, to Kraftwerk Union Aktiengesellschaft. Assembly for a core of a nuclear reactor. 4,617,170, Cl. 376-438.000.
Suda, Kaoru: *See—*
Nakata, Yukio; Suda, Kaoru; Shiotsu, Osamu; and Morito, Motoyoshi, 4,617,565, Cl. 340-825.500.
Sudo, Yoshimi: *See—*
Kuwabara, Hideki; Sudo, Yoshimi; and Kitagawa, Atusi, 4,617,323, Cl. 521-60.000.
Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG: *See—*
Dietzsch, Kurt; and Witzel, Karlheinz, 4,616,693, Cl. 165-41.000.
Sugasawa, Fukashi; Kuroki, Junsuke; and Akatsu, Yohsuke, to Nissan Motor Company, Limited. Automotive suspension control system with vehicle speed-dependent damping characteristics. 4,616,848, Cl. 280-707.000.
Sugimori, Shigeru, to Chisso Corporation. Cyclohexanecarbonylic acid ethyl ester derivatives. 4,617,142, Cl. 252-299.630.
Sugimoto, Koichi: *See—*
Sakaue, Shiyuki; Sugimoto, Koichi; and Arai, Shinichi, 4,617,502, Cl. 318-568.000.
Suginoya, Mitsuru: *See—*
Kamamori, Hitoshi; Suginoya, Mitsuru; Iwasa, Koji; Sano, Yutaka; and Terada, Yumiko, 4,617,094, Cl. 204-18.100.
Suh, Sung L.; Reeds, Carter B.; Van Scherpe, Peter; and Silcox, William H., to Chevron Research Company. Hybrid double hydrocyclone-gravity gas/liquid separator. 4,617,031, Cl. 55-52.000.
Sulzer Brothers Limited: *See—*
Baumeler, Markus, 4,616,477, Cl. 60-415.000.
Sumal, Jaihind S., to Robert Bosch GmbH. Apparatus for measuring the mass of a flowing medium and method for producing an apparatus for measuring the mass of a flowing medium. 4,616,506, Cl. 73-204.000.
Sumino, Fumio: *See—*
Tanaka, Shigemori; Sumino, Fumio; Kubo, Keiji; Hisamura, Masafumi; Toma, Hitoshi; and Fujimura, Naoto, 4,617,245, Cl. 430-58.000.
Sumitomo Electric Industries, Ltd.: *See—*
Yazu, Shuji; and Satoh, Shuichi, 4,617,181, Cl. 423-446.000.
Sumiya, Koji: *See—*
Ogasawara, Tsunehiko; Arakawa, Yoshichika; Sumiya, Koji; and Sakaguchi, Yoshikazu, 4,616,531, Cl. 74-866.000.
Sumoto, Kunihiro: *See—*
Miyano, Seiji; Sumoto, Kunihiro; Morita, Minoru; and Sato, Fumio, 4,617,401, Cl. 548-453.000.
Sun Refining and Marketing Company: *See—*
Lyons, James E., 4,617,287, Cl. 502-174.000.
Suncoast Medical Manufacturing, Inc.: *See—*
Johns, David L., 4,616,660, Cl. 128-741.000.
Suncor Inc.: *See—*
Ballachey, John M.; Jankowski, Leon V.; Johnson, C. W.; Ward, George S.; and Ward, John R., 4,616,454, Cl. 52-115.000.
Sundheimer, Craig S., to American Sterilizer Company. Method for liquid disinfecting and sterile rinsing. 4,617,065, Cl. 134-25.400.
Sundvall, Nils J.: *See—*
Johansson, Jan H.; and Sundvall, Nils J., 4,617,426, Cl. 179-16.0AA.
Sunstar Kabushiki Kaisha: *See—*
Satoh, Toshio; Miyataka, Hideki; Masamoto, Yukimitsu; Asai, Takashi; Hasegawa, Kenji; and Kakegawa, Hisao, 4,617,292, Cl. 514-27.000.
Suntory Ltd.: *See—*
Miyano, Seiji; Sumoto, Kunihiro; Morita, Minoru; and Sato, Fumio, 4,617,401, Cl. 548-453.000.
Sursum Elektrizitatsgesellschaft Leyhausen GmbH & Co.: *See—*
Westermeyer, Joseph, 4,617,540, Cl. 335-35.000.
Suss, Christian: *See—*
Pietsch, Helge; Rink, Manfred; and Suss, Christian, 4,616,874, Cl. 297-321.000.
Suzuki, Atsushi, to Fujitsu Limited. Ring oscillator with delay element and potential pulling circuit. 4,617,529, Cl. 331-57.000.
Suzuki, Hideo: *See—*
Uchiyama, Yasuji; and Suzuki, Hideo, 4,616,546, Cl. 84-1.010.
Suzuki, Hiroshi; Kanai, Masatatsu; Saitoh, Seishiro; and Kanai, Shigeru, to Tachikawa Spring Co., Ltd. Rotation adjusting apparatus. 4,616,876, Cl. 297-328.000.
Suzuki, Hiroya: *See—*
Arakawa, Shunsuke; and Suzuki, Hiroya, 4,616,424, Cl. 33-361.000.
Suzuki, Kiyosuke; Fukuma, Toshiaki; and Sato, Tatsuru, to Sony Corporation. Improved sensitizer dyes for polyvinylcarbazole electrophotographic compositions. 4,617,247, Cl. 430-81.000.
Suzuki, Kouhei; Saito, Tamio; and Mori, Ken-ichi, to Kabushiki Kaisha Toshiba. Image sensing device. 4,617,471, Cl. 250-578.000.
Suzuki, Masao: *See—*
Nagasawa, Hideo; Suzuki, Masao; and Hamano, Tsutomu, 4,616,942, Cl. 400-196.100.
Suzuki, Masayuki; Fukahori, Hidehiko; Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; and Ohara, Tsunemasa, to Canon Kabushiki Kaisha. Camera. 4,616,913, Cl. 354-173.100.
Suzuki, Mitsugu: *See—*
Kajihara, Takehiro; and Suzuki, Mitsugu, 4,616,996, Cl. 432-148.000.
Suzuki, Nobuyuki: *See—*
Someya, Hiromi; Aihara, Yoshihiko; Suzuki, Nobuyuki; and Mizogui, Toyokazu, 4,616,916, Cl. 354-442.000.
Suzuki, Toshifumi; Kawano, Toshio; Setoguchi, Ryoichi; Ishida, Toshio; and Mikami, Seiiti, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for fastening a door to a vehicle. 4,616,411, Cl. 29-822.000.
Suzuki, Yoshio; and Ohe, Takeshi, to Jidoshi Kiki Co., Ltd. Power steering device. 4,616,728, Cl. 180-142.000.
Syntex (U.S.A.) Inc.: *See—*
Whiteley, Gordon R.; Pritchard, Cynthia G.; and Barrett, Sharon S., 4,617,264, Cl. 435-34.000.
Synthelabo: *See—*
Bigg, Dennis; Morel, Claude; and Sevrin, Mireille, 4,617,313, Cl. 514-402.000.
Tabuchi, Mamoru: *See—*
Katou, Kazuo; Mizugami, Susumu; Tabuchi, Mamoru; Nakamura, Masayuki; Kobayashi, Toshiyuki; and Ritoh, Naotake, 4,616,545, Cl. 83-558.000.
Tachikawa Spring Co., Ltd.: *See—*
Suzuki, Hiroshi; Kanai, Masatatsu; Saitoh, Seishiro; and Kanai, Shigeru, 4,616,876, Cl. 297-328.000.
Taga, Kazumitsu, to Japan Constec Kabushiki Kaisha. Continuous pavement process for a bridge surface expansion joint. 4,616,954, Cl. 404-74.000.
Taguchi, Takafumi; Nakano, Masahiro; Hiramoto, Nobuo; and Tominaga, Hideki, to Mazda Motor Corporation. Cooling arrangement for water-cooled internal combustion engine. 4,616,599, Cl. 123-41.100.
Taguchi, Yoshinori; and Yamanami, Tsuguya, to Wacom Co., Ltd. Position detecting apparatus. 4,617,515, Cl. 324-207.000.
Tahara, Tetsuya; Hayano, Kiyoharu; Setoguchi, Michihide; and Fukuda, Takemi, to Yoshitomi Pharmaceutical Industries Ltd. Benzofuran- and benzopyran-carboxamide derivatives. 4,617,314, Cl. 514-422.000.
Takada, Yuji: *See—*
Morino, Masuaki; and Takada, Yuji, 4,617,650, Cl. 365-195.000.
Takahashi, Hiroshi: *See—*
Saito, Kimitaka; Kohama, Tokio; Egami, Tsuneyuki; Saito, Tsutomu; Takahashi, Hiroshi; and Sato, Kunihiko, 4,616,619, Cl. 123-489.000.
Takahashi, Hisao: *See—*
Hamada, Akira; Takahashi, Hisao; and Ohira, Keiichi, 4,617,231, Cl. 428-297.000.
Takahashi, Kazuo; Sato, Hiroshi; and Kosugi, Masao, to Canon Kabushiki Kaisha. Exposure apparatus with detecting means insertable into an exposure path. 4,617,469, Cl. 250-548.000.
Takahashi, Keiji; and Fujimoto, Sakae, to Ricoh Company, Ltd. Thermal-image-transfer recording apparatus. 4,617,577, Cl. 346-76.0PH.
Takahashi, Kenzo; Kumazaki, Nobuo; Yokoya, Hisao; Nakamura, Hironobu; and Kachi, Tadakatsu, to Mitsubishi Denki Kabushiki Kaisha. Heat exchanger. 4,616,695, Cl. 165-54.000.
Takahashi, Masaharu; Tokushige, Yuji; and Itoh, Kunio, to Shin-Etsu Chemical Co., Ltd. Method for surface priming in adhesive bonding. 4,617,078, Cl. 156-307.500.
Takahashi, Nagashige, to Kabushiki Kaisha Medos Kenkyusho. Flexible pipe assembly for endoscope. 4,616,631, Cl. 128-6.000.
Takano, Kunio; and Nukushina, Masanori, to Tokyo Juki Industrial Co., Ltd. Thread tightening control apparatus of automatic sewing machine. 4,616,583, Cl. 112-121.120.
Takasaki, Yukio: *See—*
Tanioka, Kenkichi; Shidara, Keiichi; Kuriyama, Takao; Takasaki, Yukio; Hirai, Tadaaki; Nonaka, Yasuhiko; and Inoue, Eisuke, 4,617,248, Cl. 430-95.000.
Takeda Chemical Industries, Ltd.: *See—*
Nasu, Kohji; and Minato, Ichiro, 4,617,349, Cl. 525-123.000.
Takeda, Kenji: *See—*
Inagaki, Mitsuo; Takeda, Kenji; Iwanami, Shigeki; Sasaya, Hideaki; and Nagasaku, Eiichi, 4,616,984, Cl. 418-150.000.
Takenouchi, Tomoo; Ichinomiya, Yoshiaki; and Iwanami, Yoshiyuki, to Japan Steel Works Ltd., The. Process for preparing a mother alloy for making amorphous metal. 4,617,052, Cl. 420-117.000.
Takeuchi, Daizo: *See—*
Hatanaka, Masayoshi; and Takeuchi, Daizo, 4,617,268, Cl. 435-92.000.
Takeuchi, Hiroshi, to Kabushiki Kaisha Toshiba. Method of fabricating an insulated gate type field-effect transistor. 4,616,401, Cl. 29-571.000.

Takeuchi, Tsunezo; and Mizutani, Isao, to NGK Insulators, Ltd. Vacuum conveyor system. 4,616,427, Cl. 34-92.000.
Takoshima, Takehiro: *See—*
Sone, Takehiko; Takoshima, Takehiro; and Kamijyo, Yoshimi, 4,617,487, Cl. 310-313.00D.
Talbott, Gene B. Automatic method and apparatus for transplanting crops. 4,616,578, Cl. 111-2.000.
Talman Home Federal Savings and Loan Association of Illinois, The: *See—*
Cash, David J., 4,616,852, Cl. 282-27.00R.
Tamai, Yasuo: *See—*
Aonuma, Masashi; and Tamai, Yasuo, 4,617,234, Cl. 428-328.000.
Tamaki, Akinobu; Kimura, Ken; Kawakami, Takeshi; and Irie, Masao, to Mitsubishi Denki Kabushiki Kaisha. Insulating method for rotary electric machine. 4,616,407, Cl. 29-596.000.
Tamano, Yutaka: *See—*
Arai, Shoji; Tamano, Yutaka; and Tsutsumi, Yukihiro, 4,617,286, Cl. 502-167.000.
Tamura, Katsumi: *See—*
Fuyama, Moriaki; Tamura, Katsumi; Funyu, Isao; Nunokawa, Isao; Hanazono, Masanobu; and Hirastuka, Shigetoshi, 4,617,575, Cl. 346-76.0PH.
Tamura, Yutaka: *See—*
Nezu, Yasutada; Tamura, Yutaka; Mizuno, Yuuzi; Iwamoto, Hiroshi; Yokota, Akihiro; and Maeda, Kiyoshi, 4,617,578, Cl. 346-108.000.
Tanabe, Kanichiro: *See—*
Mori, Makihiko; Nakamura, Kazuo; Tanabe, Kanichiro; and Kimura, Atsushi, 4,617,682, Cl. 382-28.000.
Tanahashi, Mitsuru: *See—*
Hoshikawa, Kyofu; Ishiwatari, Seishiro; and Tanahashi, Mitsuru, 4,617,433, Cl. 200-86.00R.
Tanaka, Hideo; and Muranaka, Shiaru, to Shibuya Kogyo Co., Ltd. Capping apparatus. 4,616,466, Cl. 53-75.000.
Tanaka, Kiyoshi; Koga, Yoshihiro; Saeki, Masaru; Kaneko, Tetsuya; and Kawakita, Tetsuya, to Ajinomoto Co., Inc. Novel lysine salt crystals and process for production thereof. 4,617,155, Cl. 260-501.120.
Tanaka, Masaki; and Ohashi, Hiroshi, to Shin-Etsu Chemical Co., Ltd. Silicone-containing fabric treatment agent. 4,617,340, Cl. 524-588.000.
Tanaka, Masaki; and Ohashi, Hiroshi, to Shin-Etsu Chemical Co., Ltd. Alkyl phosphonate ester-modified organopolysiloxane latex and a method for the preparation thereof. 4,617,344, Cl. 524-837.000.
Tanaka, Motoharu, to Ricoh Company, Ltd. Magneto-optical recording medium having recording guide tracks. 4,617,601, Cl. 360-131.000.
Tanaka, Shigemori; Sumino, Fumio; Kubo, Keiji; Hisamura, Masafumi; Toma, Hitoshi; and Fujimura, Naoto, to Canon Kabushiki Kaisha. Light receiving member having tapered reflective surfaces between substrate and light receiving layer. 4,617,245, Cl. 430-58.000.
Tanaka, Yoshikazu; Kumura, Haruyoshi; Abo, Keiju; Yamamuro, Sigeaki; and Hirano, Hiroyuki, to Nissan Motor Co., Ltd. Hydraulic control system for automatic transmission such as a continuously variable transmission. 4,616,530, Cl. 74-851.000.
Tandy Corporation: *See—*
Nakamura, Keiichi; and Horiuchi, Hideyuki, 4,617,425, Cl. 179-6.110.
Tang, I. Ping. Tooth cleaning implement. 4,616,667, Cl. 132-89.000.
Taniguchi, Ikuo: *See—*
Katagiri, Koichi; Hanamoto, Yoshihiro; Maeda, Satoru; and Taniguchi, Ikuo, 4,617,594, Cl. 358-150.000.
Taniguchi, Yoshinori: *See—*
Hiroshimo, Minoru; Matsumoto, Shinzo; Sekino, Mitsuru; and Taniguchi, Yoshinori, 4,617,644, Cl. 365-36.000.
Tanioka, Kenkichi; Shidara, Keiichi; Kuriyama, Takao; Takasaki, Yukio; Hirai, Tadaaki; Nonaka, Yasuhiko; and Inoue, Eisuke, to Nippon Hoso Kyokai; and Hitachi, Ltd. Doped photoconductive film including selenium and tellurium. 4,617,248, Cl. 430-95.000.
Tarbutton, Victor F.; Mitchell, J. Edwin; and Blumenkranz, Robert M., to General Instrument Corporation. Temperature regulated feedforward amplifier. 4,617,522, Cl. 330-149.000.
Tasch, Franz: *See—*
Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,617,672, Cl. 373-79.000.
Tate & Lyle Public Limited Company: *See—*
Rathbone, Elner B.; Hacking, Andrew J.; and Cheetham, Peter S. J., 4,617,269, Cl. 435-97.000.
Tatsuta, Nobuhiro, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Electric Co., Ltd. System for preventing stealing of line in radiotelephony. 4,617,424, Cl. 179-2.0EA.
Taylor, Daniel E. Radio controlled gate opener. 4,616,444, Cl. 49-347.000.
Taylor, Lloyd D.; and Haubs, Michael K., to Polaroid Corporation. Polymeric pyridinium ylides and products prepared from same. 4,617,253, Cl. 430-323.000.
Taylor, Rudolph T.: *See—*
Sheppard, Isaac, Jr.; Jewell, Everett; Levitz, Steven E.; and Taylor, Rudolph T., 4,616,453, Cl. 52-93.000.
Taylor, Stewart S., to Tektronix, Inc. Differential pair with compensation for effects of parasitic capacitance. 4,617,523, Cl. 330-261.000.
Tchorbov, Iliya G.: *See—*
Nikolov, Ivan D., deceased; Dimova, Vassilka P., heir; Dimov, Dobromir I., heir; Dimov, Petar I., heir; Marinov, Marin I.; Peytchev, Ivan M.; Rashev, Tzolo V.; and Tchorbov, Iliya G., 4,616,808, Cl. 266-207.000.
TDK Corporation: *See—*
Akachi, Yoshiaki; Kyoso, Yasuo; and Matsumaru, Takeo, 4,617,543, Cl. 336-192.000.
Teeple, Edward. Surgical shield. 4,616,641, Cl. 128-132.00R.
Tehon, Stephen W.: *See—*
Davis, Richard K.; Roberts, Clayton R.; and Tehon, Stephen W., 4,617,503, Cl. 318-572.000.
Tektronix, Inc.: *See—*
Culter, Robert G., 4,617,495, Cl. 315-10.000.
Taylor, Stewart S., 4,617,523, Cl. 330-261.000.
Tel Tec Inc.: *See—*
Luetzow, Edwin J., 4,616,717, Cl. 174-117.00F.
Telefonaktiebolaget LM Ericsson: *See—*
Johansson, Jan H.; and Sundvall, Nils J., 4,617,426, Cl. 179-16.0AA.
Telefunken Electronic GmbH: *See—*
Beckenbach, Walter; and Rinderle, Heinz, 4,617,524, Cl. 330-307.000.
Teleplex Corporation: *See—*
Diamond, Anthony E., 4,617,566, Cl. 340-870.110.
Telesco, Barbara. Place mat. 4,617,215, Cl. 428-43.000.
Tencol, Inc.: *See—*
Hubbard, Vance M.; and Brunson, Welton K., 4,617,017, Cl. 604-179.000.
Tennessee Valley Authority: *See—*
Salladay, David G.; and Kachelman, Donald L., 4,617,048, Cl. 71-30.000.
Tenore, Richard R.: *See—*
Lukenbach, Elvin R.; and Tenore, Richard R., 4,617,414, Cl. 558-87.000.
Terada, Yumiko: *See—*
Kamamori, Hitoshi; Suginoya, Mitsuru; Iwasa, Koji; Sano, Yutaka; and Terada, Yumiko, 4,617,094, Cl. 204-18.100.
Teramachi, Hiroshi. Linear slide bearing and linear slide table unit employing the same. 4,616,886, Cl. 384-45.000.
Testerman, Ronald D. Lottery device. 4,616,831, Cl. 273-144.00B.
Texas Instruments Incorporated: *See—*
Dudley, Dana, 4,617,593, Cl. 358-113.000.
Macksey, Harry M.; and Hudgens, Rick D., 4,616,400, Cl. 29-571.000.
Schulte, Eric F.; and Lewis, Adam J., 4,616,403, Cl. 29-572.000.
Thai, Cao M.; Oguni, Takayuki; Kurematsu, Kazuhiko; and Kato, Tsuguo, to Kabushiki Kaisha Toshiba. Epoxy resin composition for cast molding. 4,617,330, Cl. 523-220.000.
Thermionics Laboratory, Inc.: *See—*
Faria, Carl R.; and Snouse, Thomas W., 4,616,860, Cl. 285-336.000.
Thermo King Corporation: *See—*
Havemann, Robert K., 4,616,743, Cl. 192-105.0BA.
Thieme, Horst R., to YWHC, Inc. Thermostatic steam trap. 4,616,778, Cl. 236-58.000.
Thimsen, James A.: *See—*
Caspari, Richard B.; Whipple, Terry L.; and Thimsen, James A., 4,616,637, Cl. 128-84.00R.
Thomas, Alfred: *See—*
Giese, Peter; Holzmann, Rainer; Schwochert, Hans-Joachim; and Thomas, Alfred, 4,617,077, Cl. 156-245.000.
Thomas, Edna H.: *See—*
Thomas, Warren R.; and Thomas, Edna H., 4,616,748, Cl. 206-214.000.
Thomas, Mammen: *See—*
Wang, Scott W.; Thomas, Mammen; and Ko, Wen C., 4,616,404, Cl. 29-576.00B.
Thomas, Warren R.; and Thomas, Edna H. Container for artist's pastels. 4,616,748, Cl. 206-214.000.
Thompson, Kenneth J.; Rosenquist, Joel C.; and Foster, Wayne G., to Sara Lee Corporation. Material handling system. 4,616,820, Cl. 271-189.000.
Thomson-CSF: *See—*
Berger, Jean-Luc, 4,617,595, Cl. 358-213.000.
Bert, Alain; and Mamodaly, Narguise, 4,617,528, Cl. 331-56.000.
Iliou, Louis; and Gotkovsky, Bruno, 4,616,413, Cl. 29-832.000.
Letoquart, Bruno, 4,617,569, Cl. 342-412.000.
Thomson, Graham C., III: *See—*
Simmons, Eugene D.; Thomson, Graham C., III; and Reynaud, Richard J., 4,616,981, Cl. 417-378.000.
Thrasher, David L.: *See—*
Tullis, Barclay J.; Parikh, Mihir; Thrasher, David L.; and Johnston, Mark E., 4,616,683, Cl. 141-98.000.
Tieleman, Rudolf J., to Linco Holland Engineering B.V. Poultry holding mechanism with improved bottom pressing means. 4,616,380, Cl. 17-11.000.
Tigges, Michael: *See—*
Deicke, Axel; and Tigges, Michael, 4,617,510, Cl. 324-51.000.
Tighe, William R.: *See—*
McFalls, Bob L.; and Tighe, William R., 4,616,875, Cl. 297-325.000.
Timron Instruments, Incorporated: *See—*
Betz, John J. E., 4,617,013, Cl. 604-39.000.
Tincati, Franco, to SARCMI S.p.A. Automatic bottling machine bottle holder. 4,616,684, Cl. 141-114.000.
Tindall, Colin: *See—*
Gibson, Stanley; Tindall, Colin; and Graham, John, 4,617,451, Cl. 219-490.000.
Titchener, Paul F.: *See—*
Hanson, Merle E.; Titchener, Paul F.; and Hamberlin, Clifford W., 4,616,702, Cl. 166-65.100.

TMC Corporation: *See—*
Freisinger, Henry; Luschnig, Franz; Stritzl, Karl; and Zotter, Johann, 4,616,843, Cl. 280-618.000.
Toa Medical Electronics Co., Ltd.: *See—*
Matsuda, Noriaki; and Shinkai, Etsuro, 4,617,275, Cl. 436-10.000.
Tobias, Samuel J.: *See—*
Messinger, Robert; and Tobias, Samuel J., 4,617,117, Cl. 210-198.100.
Tobiasz, Henry: *See—*
Rollins, Richard A.; Sluga, Thomas J.; and Tobiasz, Henry, 4,617,161, Cl. 264-136.000.
Tokunaga, Ichiro; Matsunaga, Hiroshi; and Shimojima, Yoji, to Alps Electric Co., Ltd. Optical fiber sensor having shaped ends. 4,617,460, Cl. 250-227.000.
Tokushige, Yuji: *See—*
Takahashi, Masaharu; Tokushige, Yuji; and Itoh, Kunio, 4,617,078, Cl. 156-307.500.
Tokyo Electric Co., Ltd.: *See—*
Nagai, Junshiro, 4,616,941, Cl. 400-120.000.
Tokyo Juki Industrial Co., Ltd.: *See—*
Takano, Kunio; and Nukushina, Masanori, 4,616,583, Cl. 112-121.120.
Tokyo Sanyo Electric Co., Ltd.: *See—*
Tatsuta, Nobuhiro, 4,617,424, Cl. 179-2.0EA.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Ikeya, Hirotoshi; and Hatanaka, Akiko, 4,617,584, Cl. 357-72.000.
Kobayashi, Hiroshi; Hirose, Tsuguhiro; and Haruyama, Hideaki, 4,617,656, Cl. 370-74.000.
Ohyama, Iwane, 4,616,966, Cl. 409-132.000.
Yasui, Mitsuru, 4,617,585, Cl. 357-72.000.
Tolman, Richard L.: *See—*
Ashton, Wallace; Walton, Edward; and Tolman, Richard L., 4,617,304, Cl. 514-261.000.
Tolpin, Thomas W.; and Kretchmer, Richard A., to Standard Oil Company (Indiana). Nitrogen oxide, sulfur oxide, and particulate removal system. 4,617,175, Cl. 422-171.000.
Toma, Hitoshi: *See—*
Tanaka, Shigemori; Sumino, Fumio; Kubo, Keiji; Hisamura, Masafumi; Toma, Hitoshi; and Fujimura, Naoto, 4,617,245, Cl. 430-58.000.
Tomaszewski, Thaddeus W., to OMI International Corporation. Electrolytic post treatment of chromium substrates. 4,617,095, Cl. 204-41.000.
Tomblin, Graham J.; Wexler, Karen B.; Ford, John P.; and Fischer, Stuart G., to Lifecodes Corp. Process and apparatus for purifying and concentrating DNA from crude mixtures containing DNA. 4,617,102, Cl. 204-299.00R.
Tomforde, Johann: *See—*
Sacco, Bruno; Tomforde, Johann; Paschke, Joachim; and Leschke, Harald, 4,616,869, Cl. 296-1.00S.
Tominaga, Hideki: *See—*
Taguchi, Takafumi; Nakano, Masahiro; Hiramoto, Nobuo; and Tominaga, Hideki, 4,616,599, Cl. 123-41.100.
Tomisawa, Naoki, to Japan Electronic Control Systems Company Limited. Voltage regulator for a microcomputer system. 4,617,509, Cl. 323-303.000.
Tomlinson, Ronald S., to Heil-Quaker Corporation. Gas burner with means for reducing NO_x emissions. 4,616,994, Cl. 431-347.000.
Tomm, Dagwin; Kolb, Dieter; Gehrig, Siegmund; and Meyer, Alfred, to Fichtel & Sachs AG. Friction clutch unit with a stop element for limiting presser plate travel. 4,616,744, Cl. 192-109.00R.
Toohey, Kevin I., to F.F. Seeley Nominees Pty. Ltd. Grille control. 4,616,563, Cl. 98-40.300.
Tornero, Lino E. Hydropneumatic spring cylinder and method of filling the same. 4,616,812, Cl. 267-131.000.
Total Air, Inc.: *See—*
Ball, Lewis C.; and Delia, Anthony F., 4,616,558, Cl. 98-40.110.
'Totes', Incorporated: *See—*
Okuda, Toshio, 4,616,868, Cl. 294-137.000.
Toyo Boseki Kabushiki Kaisha: *See—*
Ohta, Toshihiko; Okada, Fujio; and Okumoto, Kiyokazu, 4,617,233, Cl. 428-364.000.
Toyo Soda Manufacturing Co., Ltd.: *See—*
Arai, Shoji; Tamano, Yutaka; and Tsutsumi, Yukihiro, 4,617,286, Cl. 502-167.000.
Tsuzuki, Kenji; and Morinaka, Hideo, 4,617,397, Cl. 546-304.000.
Toyoda Gosei Co., Ltd.: *See—*
Asano, Tetsuji; Kodama, Keiichi; and Shigeki, Terumitsu, 4,617,213, Cl. 428-36.000.
Toyomaki, Kazuya: *See—*
Hikawa, Kazuo; Toyomaki, Kazuya; and Yamazaki, Hiroyuki, 4,617,526, Cl. 331-1.00A.
Toyota Jidosha Kabushiki Kaisha: *See—*
Akashi, Teruo; Ito, Hiroshi; and Yamada, Shigemichi, 4,616,521, Cl. 74-335.000.
Buma, Shuuichi, 4,616,811, Cl. 267-35.000.
Itho, Joji, 4,616,594, Cl. 118-326.000.
Miura, Hirohisa; Satou, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,617,055, Cl. 75-251.000.
Morisawa, Kunio; and Kondo, Tadashi, 4,616,526, Cl. 74-606.00R.
Okamoto, Yuji, 4,616,446, Cl. 49-441.000.
Saito, Kimitaka; Kohama, Tokio; Egami, Tsuneyuki; Saito, Tsutomu; Takahashi, Hiroshi; and Sato, Kunihiko, 4,616,619, Cl. 123-489.000.
Sakai, Takahiro; and Minemoto, Isamu, 4,616,532, Cl. 74-869.000.
Watanabe, Hiroyuki; Hamada, Eiichi; Hayashi, Motomu; and Ono, Kenji, 4,616,445, Cl. 49-374.000.
Tracy, David H.; and Balistee, Brian G., to Perkin Elmer Corporation, The. Plasma etching system. 4,617,079, Cl. 156-345.000.
Transmet Corporation: *See—*
Overturf, John R., 4,617,198, Cl. 427-186.000.
Traverso, Enrico: *See—*
Costanzi, Silvestro; Traverso, Enrico; Podesta , Roberto; Gussoni, Damiano; and Busetto, Carlo, 4,617,333, Cl. 524-96.000.
Traxler, Manfred: *See—*
Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,617,672, Cl. 373-79.000.
Trefts, George M. Golf ball and tee setting apparatus. 4,616,826, Cl. 273-32.500.
Tremonti, Ronald R.: *See—*
Gindy, Sherif S.; and Tremonti, Ronald R., 4,616,511, Cl. 73-862.040.
Tresca, Benoit: *See—*
Pigneul, Raymond; Pannier, Dominique; and Tresca, Benoit, 4,617,022, Cl. 604-391.000.
Trilogy Computer Development Partners, Ltd.: *See—*
Reinschmidt, Robert M., 4,617,475, Cl. 307-441.000.
Trimmel, Wolfgang: *See—*
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Steinkuhl, Allan R.; and Cayton, Steven D., 4,616,671, Cl. 137-101.000.
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Fohl, Artur, 4,616,878, Cl. 297-483.000.
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Akira, Takashima; Kobayashi, Masahiko; Nasu, Hitoo; Okida, Yoshishiro; and Tsuji, Kazuhiko, 4,616,872, Cl. 296-190.000.
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Arai, Shoji; Tamano, Yutaka; and Tsutsumi, Yukihiro, 4,617,286, Cl. 502-167.000.
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Tubular Fabricators, Industry, Inc.: *See—*
Battiston, Joseph, 4,616,668, Cl. 135-75.000.
Tucker, Kenneth W.: *See—*
Joo, Louis A.; Tucker, Kenneth W.; and Shaner, Jay R., 4,617,053, Cl. 75-244.000.
Tuffy Books, Inc.: *See—*
Mann, Philip, 4,616,851, Cl. 281-15.00R.
Tullis, Barclay J.; Parikh, Mihir; Thrasher, David L.; and Johnston, Mark E., to Hewlett-Packard Company. Particle-free dockable interface for integrated circuit processing. 4,616,683, Cl. 141-98.000.
Tunks, M. Larry. Crank and braking mechanism for fishing reels. 4,616,792, Cl. 242-218.000.
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Tutco, Inc.: *See—*
Howard, H. Keith; Sherrill, Jimmy L.; and Kirby, Robert L., 4,617,547, Cl. 338-317.000.
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Himmelstein, Sydney; Tveter, Richard S.; and Beck, James P., 4,616,512, Cl. 73-862.360.
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Matsui, Isamu; Uchida, Hiroshi; Nakanishi, Kazuo; and Shimano, Akira, 4,616,789, Cl. 242-35.50R.
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Ueda, Kenji: *See—*
Saito, Koichi; Ueda, Kenji; Ikeda, Yasuo; and Ono, Tetsuji, 4,617,289, Cl. 502-339.000.

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Siekmann, Helmut E.; Bassler, Jurgen; and Liebig, Winfried, 4,617,130, Cl. 210-748.000.
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Chin, Aland K.; Singh, Shobha; Uitert, LeGrand G. V.; and Zydzik, George J., 4,617,192, Cl. 427-42.000.
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Sawada, Satoru; and Ukai, Toshinao, 4,617,257, Cl. 430-560.000.
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Ultimate Security Products Corp.: *See—*
Bryant, Edgar E., 4,616,863, Cl. 292-302.000.
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Hessbruggen, Norbert, 4,616,538, Cl. 82-40.00R.
Undin, Hans: *See—*
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Unerdem, M. Tarik, to Exar Corporation. PSK digital echo modulator with reduced memory capacity required. 4,617,535, Cl. 332-16.00R.
Unger, H. Peter: *See—*
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Union Carbide Corporation: *See—*
Coughlin, Peter K., 4,617,283, Cl. 502-66.000.
Coughlin, Peter K.; and Rabo, Jule A., 4,617,320, Cl. 518-719.000.
D'Silva, Themistocles D. J., 4,617,295, Cl. 514-97.000.
Keogh, Michael J.; Wallace, Scott L.; and Brown, Geoffrey D., 4,617,338, Cl. 524-437.000.
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Senftle, Joseph T.; and Larter, Stephen R., 4,617,467, Cl. 250-461.100.
Uniroyal Chemical Company, Inc.: *See—*
Weaver, Ebon P., 4,617,227, Cl. 428-220.000.
United Kingdom Atomic Energy Authority: *See—*
Kaye, Alan S., 4,617,670, Cl. 372-104.000.
Lovegrove, Peter C., 4,617,103, Cl. 204-300.00R.
United States Gypsum Company: *See—*
Wendt, Alan C., 4,616,461, Cl. 52-481.000.
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Agriculture: *See—*
Harris, Clarence E., Jr., 4,616,381, Cl. 17-45.000.
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McAllister, Jack D., 4,617,633, Cl. 364-434.000.
Reinovsky, Robert E., 4,616,565, Cl. 102-202.700.
Army: *See—*
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Kronenberg, Stanley, 4,617,464, Cl. 250-377.000.
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Brodzinski, Ronald L.; Perkins, Richard W.; Rieck, Henry G.; and Wogman, Ned A., 4,617,169, Cl. 376-257.000.
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Danesi, Pier R., 4,617,125, Cl. 210-638.000.
Elmaleh, David R.; Levy, Shlomo; Shiue, Chyng-Yann; and Wolf, Alfred P., 4,617,386, Cl. 536-122.000.
Haushalter, Robert C., 4,617,204, Cl. 427-304.000.
Holt, Roy J., 4,617,462, Cl. 250-251.000.
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Kruse, Lyle W.; and McKnight, Richard P., 4,617,167, Cl. 376-153.000.
Menlove, Howard O.; and Stewart, James E., 4,617,466, Cl. 250-390.000.
National Aeronautics and Space Administration: *See—*
Hassler, John M., Jr., 4,616,793, Cl. 244-137.00A.
Navy: *See—*
Lau, Yue-Ying, 4,617,493, Cl. 315-5.000.
Young, James R., 4,617,530, Cl. 331-78.000.
U.S. Peroxygen Company: *See—*
Muenchow, John R.; Bock, Lawrence A.; and Lewis, Roger N., 4,617,324, Cl. 521-96.000.
U.S. Philips Corporation: *See—*
Aldenhoven, Ghislanus M. A. M., 4,617,655, Cl. 369-291.000.
Buijsen, Johannes C. M., 4,617,484, Cl. 310-51.000.
Cuvilliers, Bernard; and Jourdain, Philippe, 4,617,586, Cl. 357-80.000.
Groenewegen, Martinus A., 4,616,682, Cl. 140-71.500.
Haisma, Jan; Heller, Petrus; Pasmans, Johannes M. M.; and Biermann, Udo K. P., 4,617,206, Cl. 427-374.100.
Lill, Graham D., 4,617,534, Cl. 331-117.00R.
Meerman, Wilhelmus C. P. M., 4,617,041, Cl. 65-2.000.
Somers, Gerardus H. J., 4,617,600, Cl. 360-113.000.
United States Surgical Corporation: *See—*
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United Technologies Corporation: *See—*
Couch, Robert P., 4,617,629, Cl. 364-431.020.
Rosenbush, David M.; Zwicke, Philip E.; and Couch, Robert P., 4,617,631, Cl. 364-431.020.
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Unitika Ltd.: *See—*
Shinonome, Osami; Ikeda, Takasi; Kanmuri, Yoshihiro; and Matuoka, Fumio, 4,617,235, Cl. 428-374.000.
University of Cincinnati: *See—*
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Salyer, Ival O.; and Griffen, Charles W., 4,617,332, Cl. 524-4.000.
University of Florida: *See—*
Bodor, Nicholas S.; Estes, Kerry S.; and Simpkins, James W., 4,617,298, Cl. 514-176.000.
University of Rochester: *See—*
Mourou, Gerard; Norris, Theodore B.; and Sizer, Theodore, II, 4,617,665, Cl. 372-18.000.
University Patents, Inc.: *See—*
Remers, William A., 4,617,389, Cl. 544-142.000.
UOP Inc.: *See—*
Funk, Edward W.; Kulkarni, Sudhir S.; and Chang, Y. Alice, 4,617,126, Cl. 210-651.000.
Uraca Pumpenfabrik GmbH & Co. KG: *See—*
Hanafi, Nabil, 4,616,983, Cl. 417-571.000.
Urata, Satoshi: *See—*
Okada, Hidetake; and Urata, Satoshi, 4,617,037, Cl. 62-11.000.
Urban, Manfred: *See—*
Spietschka, Ernst; and Urban, Manfred, 4,617,403, Cl. 549-56.000.
Urbani, William G., to Industrial Innovations, Inc. Recycled liquid cleaning system. 4,616,377, Cl. 15-302.000.
Usami, Katsuyuki: *See—*
Ueki, Toru; Fukuda, Yoshiaki; Usami, Katsuyuki; and Kanasaki, Kazuharu, 4,617,207, Cl. 428-1.000.
Ushijima, Hiroyuki; Shimomura, Hiroshi; and Nakayama, Masaaki, to Mitsubishi Kinzoku Kabushiki Kaisha. Cutter insert. 4,616,962, Cl. 407-113.000.
Uskokovic, Milan R.: *See—*
Boris, Alfred; Partridge, John J.; and Uskokovic, Milan R., 4,617,297, Cl. 514-167.000.
USM Corporation: *See—*
Karcher, Ralph E., Jr.; and Greene, Blandford W., 4,616,592, Cl. 118-202.000.
Moran, Michael J., 4,616,722, Cl. 177-99.000.
Utner, Ferdinand; and Bolz, Herbert, to Siemens Aktiengesellschaft. Electric capacitor in the form of a chip component and method for manufacturing same. 4,617,609, Cl. 361-310.000.
Utoh, Yoshihiro; Shibata, Shinichi; and Kitahara, Hiroyuki, to Kabushiki Kaisha Toshiba. Case having snap-on cover. 4,616,764, Cl. 220-306.000.
Utsumi, Shigeo: *See—*
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Utumi, Masahiro: *See—*
Yamaguchi, Nobutaka; Utumi, Masahiro; Fujiyama, Masaaki; and Miyoshi, Takahito, 4,617,226, Cl. 428-216.000.
Vaillancourt, Vincent L., to Manresa, Inc. Sterile connector with movable connection member. 4,617,012, Cl. 604-29.000.
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Billet, Rene , 4,616,741, Cl. 192-70.180.
Jaccod, Michel; and de Briel, Jacques T., 4,617,005, Cl. 474-14.000.
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Vallourec: *See—*
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Vander Heyden, Randy J.: *See—*
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van der Lely, Cornelis. Seed sowing machine with monitoring system. 4,616,577, Cl. 111-1.000.
Vanderveer, William R.: *See—*
Wood, Robert F.; and Vanderveer, William R., 4,616,489, Cl. 68-200.000.
van der Vleugel, Dominicus J. M.; Hoving, Klaas; Wortel, Theodorus M.; Rosensweig, Ronald E.; and Rees, Lovat V. C., to Exxon Research & Engineering Co. Magnetizable adsorbents. 4,617,282, Cl. 502-66.000.
Van Egmond, Cor F. H.: *See—*
Stegemeier, George L.; Van Meurs, Peter; and Van Egmond, Cor F. H., 4,616,705, Cl. 166-250.000.
Van Meurs, Peter: *See—*
Stegemeier, George L.; Van Meurs, Peter; and Van Egmond, Cor F. H., 4,616,705, Cl. 166-250.000.
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Suh, Sung L.; Reeds, Carter B.; Van Scherpe, Peter; and Silcox, William H., 4,617,031, Cl. 55-52.000.
Vantard, Georges, to Hospal Industrie. Artificial kidney with disposable dialysis liquid circuit. 4,617,115, Cl. 210-90.000.
Van Woensel, Dirk; and Van Woensel, Ilja, to Megapel BV Mechanische Garnalenpeltechniek. Shrimp-peeling machine according to the method. 4,616,382, Cl. 17-73.000.

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Van Woensel, Dirk; and Van Woensel, Ilja, 4,616,382, Cl. 17-73.000.

Vapor Corporation: *See—*
Malinski, Richard F.; and Sikorcin, John, 4,616,528, Cl. 74-626.000.

Vara, Tomas E.: *See—*
Anderson, Clyde G.; and Vara, Tomas E., 4,617,270, Cl. 435-161.000.

Varadarajan, Hemmige D. Emitter coupled logic having enhanced speed characteristic for turn-on and turn-off. 4,617,478, Cl. 307-455.000.

Vargas Garcia, Arturo, to Commonwealth of Puerto Rico. Retractor for use in oral and maxillofacial surgery. 4,616,633, Cl. 128-20.000.

Vargas Garcia, Arturo, to Commonwealth of Puerto Rico. Soft tissue protector for use in oral and maxillofacial surgery. 4,616,634, Cl. 128-20.000.

Varian Associates, Inc.: *See—*
Wells, Gregory J., 4,617,032, Cl. 55-67.000.

Vartoukian, Artin G.; and Haggerty, Robert P., to Singer Company, The. Method and apparatus for sewing mitered corners of box type articles. 4,616,584, Cl. 112-121.150.

Vasudev, Prahalad K., to Hughes Aircraft Company. Process of making semiconductors having shallow, hyperabrupt doped regions by implantation and two step annealing. 4,617,066, Cl. 148-1.500.

VDO Adolf Schindling AG: *See—*
Collonia, Harald, 4,616,613, Cl. 123-339.000.
Sausner, Andreas; and Ruschek, Gerhard, 4,617,505, Cl. 318-626.000.

Vea, Mathew P.; and Gupta, Vinita, to Northern Telecom Limited. Square root circuit. 4,617,427, Cl. 179-84.0VF.

Veltri, Robert W.: *See—*
Maxim, Peter E.; and Veltri, Robert W., 4,617,262, Cl. 435-7.000.

Verdier, Jean-Michel; Jacubert, Serge; Grosbois, Jean; and Dumousseau, Jean-Yves, to Rhone-Poulenc Specialites Chimiques. Continuous electrolysis of lithium chloride into lithium metal. 4,617,098, Cl. 204-68.000.

Veronesi, Luciano: *See—*
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Ehrlinger, Friedrich; Katzorek, Karl-Hermann; Dziuba, Peter; Veser, Karl; and Caspar, Peter, 4,616,520, Cl. 74-325.000.

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Boyers, Charles L.; and Finlayson, John W., 4,616,987, Cl. 425-89.000.

Veyrier, Maurice, to Aluminium Pechiney. Process for effecting seeding in two phases for producing large-grain alumina. 4,617,179, Cl. 423-121.000.

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Fukuda, Hasatoshi, 4,617,588, Cl. 358-31.000.
Hikawa, Kazuo; Toyomaki, Kazuya; and Yamazaki, Hiroyuki, 4,617,526, Cl. 331-1.00A.

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Vijuk, Michael, 4,616,815, Cl. 270-45.000.

Vijuk, Michael, to Vijuk Bindery Equipment, Inc. Automatic stacking and folding apparatus. 4,616,815, Cl. 270-45.000.

Vincent, James H.: *See—*
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Vinson, Edward: *See—*
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Vischer, Peter, to Adolph Coors Company. Carton blank feed apparatus. 4,616,818, Cl. 271-113.000.

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Lewis, Duane J.; and McNeese, William H., 4,617,183, Cl. 423-630.000.

Voest-Alpine Aktiengesellschaft: *See—*
Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,617,672, Cl. 373-79.000.
Lugscheider, Walter; Mullner, Paul; Schiffer, Wilhelm; and Leutgob, Alois, 4,617,671, Cl. 373-22.000.

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Vogt, Robert E.: *See—*
Oshefsky, Daniel J.; Gavronski, Paul A.; Vogt, Robert E.; and Rajala, Gregory J., 4,617,082, Cl. 156-447.000.

Voigt, Klaus-Ditmar: *See—*
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Volkswagenwerk Aktiengesellschaft: *See—*
Geiger, Istvan; and Waschatz, Uwe, 4,616,617, Cl. 123-436.000.

VOLVO BM AB: *See—*
Johansson, Sixten, 4,616,726, Cl. 180-135.000.

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von Gruenberg, Hubertus: *See—*
Kircher, Dieter; von Gruenberg, Hubertus; Blum, Klaus D.; and Becker, Peter, 4,616,727, Cl. 180-142.000.

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Vora, Madhukar B., to Fairchild Semiconductor Corporation. Method of fabricating electrically connected regions of opposite conductivity type in a semiconductor structure. 4,617,071, Cl. 148-188.000.

Voss, Karl D., to General Motors Corporation. Countergravity casting apparatus. 4,616,691, Cl. 164-255.000.

VSL Corporation: *See—*
Davis, Edgar A.; Dexter, Rose M.; and McCarthy, John D., 4,616,458, Cl. 52-230.000.

W. R. Grace & Co., Cryovac Div.: *See—*
Mueller, Walter B., 4,617,241, Cl. 428-520.000.
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Wacom Co., Ltd.: *See—*
Taguchi, Yoshinori; and Yamanami, Tsuguya, 4,617,515, Cl. 324-207.000.

Waddey, Walter E.: *See—*
Shaub, Harold; and Waddey, Walter E., 4,617,026, Cl. 44-70.000.

Wade, Charles R., III. Beam compass having changeable parts. 4,616,418, Cl. 33-27.010.

Wade, Richard D.: *See—*
Brain, Michael; Wade, Richard D.; and Barker, Brian, 4,616,467, Cl. 53-134.000.

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Bjornberg, Sten G.; Hjerten, Wilhelm E. S.; and Wadstrom, Torkel M., 4,617,326, Cl. 523-111.000.

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Blocher, Eberhard; Grob, Ferdinand; Schmidt, Peter-Jurgen; and Wahl, Josef, 4,616,618, Cl. 123-478.000.

Wahlig, Helmut; Dingeldein, Elvira; Kirchlechner, Richard; Orth, Dieter; and Rogalski, Werner, to Merck Patent Gesellschaft mit beschraenkter Haftung. Flavonoid phosphate salts of aminoglycoside antibiotics. 4,617,293, Cl. 514-41.000.

Waite, Ralph A.: *See—*
Jackson, Joseph F.; and Waite, Ralph A., 4,616,838, Cl. 279-4.000.

Wakaizumi, Akira; and Kawakami, Hiroshi, to Nippon Sanso Kabushiki Kaisha. Gas adsorbent and process for producing same. 4,617,035, Cl. 55-389.000.

Walbro Corporation: *See—*
Haas, Albert L., 4,616,805, Cl. 251-297.000.

Walker, James L.; and Mitry, Mourad T., to National Starch and Chemical Corporation. Laminating adhesives containing polymerized surfactant. 4,617,343, Cl. 524-817.000.

Walker, Kenneth A., to Environmental Elements Corp. Method and system of cleansing a filter bed. 4,617,131, Cl. 210-794.000.

Walker, Kenneth L.: *See—*
MacChesney, John B.; Simpson, Jay R.; and Walker, Kenneth L., 4,616,901, Cl. 350-96.340.

Walker, Mary A.: *See—*
Knobel, Thomas M.; Kennedy, Earl E.; and Walker, Mary A., 4,617,325, Cl. 521-105.000.

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Wallace, Scott L.: *See—*
Keogh, Michael J.; Wallace, Scott L.; and Brown, Geoffrey D., 4,617,338, Cl. 524-437.000.

Wallow, Peter: *See—*
Montier, Patrick; Sauvestre, Jean-Claude; Bethmann, Karl W.; Bisping, Bernhard; and Wallow, Peter, 4,616,569, Cl. 102-517.000.

Walter, Herbert: *See—*
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Walters, Stephen M., to Bell Communications Research, Inc. Frame arrangement for multiplexing a plurality of subchannels onto a fixed rate channel. 4,617,658, Cl. 370-84.000.

Walton, Edward: *See—*
Ashton, Wallace; Walton, Edward; and Tolman, Richard L., 4,617,304, Cl. 514-261.000.

Wang, Richard H. S.: *See—*
Pruett, Wayne P.; Wang, Richard H. S.; Hilbert, Samuel D.; and Weaver, Max A., 4,617,373, Cl. 528-288.000.
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Ward, David R.: *See—*
Mehdi, Syed A.; Zieske, William E.; and Ward, David R., 4,616,484, Cl. 62-180.000.

Ward, George S.: *See—*
Ballachey, John M.; Jankowski, Leon V.; Johnson, C. W.; Ward, George S.; and Ward, John R., 4,616,454, Cl. 52-115.000.

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Ward, Marcus J. S., to Ford Motor Company. Electrically controlled door locking system. 4,616,862, Cl. 292-201.000.

Warner-Lambert Company: *See—*
Butler, Donald E., 4,617,310, Cl. 514-343.000.
Cannon, Raymond E.; and Bloomquist, Ted C., 4,617,014, Cl. 604-67.000.

Mich, Thomas F.; and Domagala, John M., 4,617,308, Cl. 514-312.000.

Warren, Leslie F., Jr.: *See—*
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Waschatz, Uwe: *See—*
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Washer, Stone P.; and Bush, Bruce A., to Phillips Petroleum Company. Mixing fluids. 4,616,669, Cl. 137-1.000.

Watanabe, Asao: *See—*
Yoshida, Tadashi; Shimizu, Katsuichi; Arimoto, Shinobu; Maeshima, Katsuyoshi; Nagashima, Nao; and Watanabe, Asao, 4,617,596, Cl. 358-280.000.

Watanabe, Hiroyuki; Hamada, Eiichi; Hayashi, Motomu; and Ono, Kenji, to Toyota Jidosha Kabushiki Kaisha. Construction of door in motor vehicle. 4,616,445, Cl. 49-374.000.

Watanabe, Katsushi; Kageyama, Takafumi; Kano, Taisaku; Hirai, Koichi; and Ichihara, Yoshinobu, to Mitsui Toatsu Chemicals, Inc. Methyl methacrylate syrup composition. 4,617,367, Cl. 526-273.000.

Watanabe, Yoshikazu: *See—*
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Watkins, James W.: *See—*
Scott, Bruce D.; and Watkins, James W., 4,617,194, Cl. 427-54.100.

Watson, Robert M.: *See—*
Sheldon, Edward L., III; Levenson, Corey H.; Mullis, Kary B.; Rapoport, Henry; and Watson, Robert M., 4,617,261, Cl. 435-6.000.

Weaver, Ebon P., to Uniroyal Chemical Company, Inc. Asphalt elastomeric blends. 4,617,227, Cl. 428-220.000.

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Pruett, Wayne P.; Wang, Richard H. S.; Hilbert, Samuel D.; and Weaver, Max A., 4,617,373, Cl. 528-288.000.
Pruett, Wayne P.; Wang, Richard H. S.; Hilbert, Samuel D.; and Weaver, Max A., 4,617,374, Cl. 528-288.000.

Weber, Bruce A.: *See—*
Lutz, Erno B.; Weber, Bruce A.; and Markle, Jerry, 4,617,542, Cl. 335-196.000.

Weber, James R.; and Weber, John R. Constant flow rotary spraying device. 4,616,783, Cl. 239-216.000.

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Webster, Mark A.; and Roberts, Richard D., to Harris Corporation. Enhanced Miller code. 4,617,553, Cl. 340-347.0DD.

Weckenbrock, Hermann J., to RCA Corporation. Adaptive frame comb filter system. 4,617,589, Cl. 358-31.000.

Weese, Richard H.; Crook, Evan H.; and Liwak, Susan M., to Rohm and Haas Company. Pigmented thermoplastic resins. 4,617,329, Cl. 523-201.000.

Wegner, Eugene H., to Phillips Petroleum Company. Biochemical conversions by yeast fermentation at high cell densities. 4,617,274, Cl. 435-255.000.

Weier, Richard M.: *See—*
Collins, Paul W.; and Weier, Richard M., 4,617,411, Cl. 556-443.000.

Weinberg, Alvin H.; and Jones, W. Kinzy, to Cordis Corporation. Implantable pulse generator having a single printed circuit board and a chip carrier. 4,616,655, Cl. 128-419.00P.

Weiss, Isidor, to Deggendorfer Werft und Eisenbau Gesellschaft m.b.H. Locking mechanism for a self-dumping barge. 4,616,587, Cl. 114-29.000.

Weissenfeld-Richters, H.: *See—*
Beutel, Achim, 4,616,837, Cl. 277-153.000.

Weissman, Bernard, to IPCO Corporation. Bonding dental pin. 4,616,999, Cl. 433-225.000.

Weith, Andre : *See—*
Albert, Alban; Courbat, Pierre; and Weith, Andre , 4,617,296, Cl. 514-100.000.

Weitzel, Harold B.; and Parman, David G., to Ricwil, Incorporated. Heating device for utilizing the skin effect of alternating current. 4,617,449, Cl. 219-301.000.

Wells, Gregory J., to Varian Associates, Inc. Sample modulator cell for gas chromatography. 4,617,032, Cl. 55-67.000.

Wells, Thomas A.; and Petterson, William C., to M. W. Kellogg Company, The. Combustion air preheating. 4,617,109, Cl. 208-130.000.

Welzel, Dieter; and Buhlmann, Hans, to Sandoz Ltd. Pharmaceutical preparation comprising co-dergocrine and a calcium antagonist. 4,617,306, Cl. 514-288.000.

Wendt, Alan C., to United States Gypsum Company. Wall panel attachment hook. 4,616,461, Cl. 52-481.000.

Werthessen, Nicholas H., to Fru-Con Construction Corporation. Retraction assemblies for expansible mandrels. 4,616,958, Cl. 405-246.000.

Wesbar Corporation: *See—*
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West, Gary A.: *See—*
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Westberg, J. Eric: *See—*
Ohlin, L. Erik; Unger, H. Peter; and Westberg, J. Eric, 4,617,009, Cl. 494-21.000.

Westermeyer, Joseph, to Sursum Elektrizitatsgesellschaft Leyhausen GmbH & Co. Automatic switch, rail-mounted. 4,617,540, Cl. 335-35.000.

Westinghouse Electric Corp.: *See—*
Bevilacqua, Bruce W.; Klug, Ralph W.; Carlsen, David C.; and Dinucci, Dennis J., 4,616,498, Cl. 72-53.000.
Fox, David A., 4,617,622, Cl. 363-98.000.
Harman, Douglas G.; Veronesi, Luciano; and Wowczuk, Andrew, 4,616,497, Cl. 72-53.000.
Hawkins, Phillip J., 4,616,496, Cl. 72-53.000.
Kellogg, Walter J.; DeVault, Birch L.; and Paape, Kenneth L., 4,617,546, Cl. 337-170.000.
Snyder, David A., 4,616,392, Cl. 29-283.500.
Spink, Thomas E.; and Rushing, Frank C., 4,616,554, Cl. 89-1.806.

Westvaco Corporation: *See—*
Forbes, Hampton E., Jr., 4,616,751, Cl. 206-485.000.
Jones, Thomas B., Jr.; and Nikkel, Willem A., 4,617,076, Cl. 156-205.000.

Wetzel, Robert E.; and Marsh, Richard L., to Dayco Corporation. Method of making a belt. 4,617,075, Cl. 156-137.000.

Wexler, Karen B.: *See—*
Tomblin, Graham J.; Wexler, Karen B.; Ford, John P.; and Fischer, Stuart G., 4,617,102, Cl. 204-299.00R.

Wheeler, Harold E., to Wheeler Tool Company. Rotary synchronous cross drilling attachment. 4,616,385, Cl. 29-27.00C.

Wheeler Tool Company: *See—*
Wheeler, Harold E., 4,616,385, Cl. 29-27.00C.

Whipple, Terry L.: *See—*
Caspari, Richard B.; Whipple, Terry L.; and Thimsen, James A., 4,616,637, Cl. 128-84.00R.

Whirlpool Corporation: *See—*
Stein, Ray J.; and Simons, Raymond G., 4,617,157, Cl. 261-96.000.

White, George E.; and Heckel, Dennis C., to Chrysler Corporation. Steering column energy absorbing release bushing and deforming bracket. 4,616,522, Cl. 74-492.000.

Whitehead, Alan B.: *See—*
Mandelson, John; McCarthy, David J.; Sitnai, Oto; and Whitehead, Alan B., 4,617,107, Cl. 208-427.000.

Whiteley, Gordon R.; Pritchard, Cynthia G.; and Barrett, Sharon S., to Syntex (U.S.A.) Inc. Pretreatment method and composition. 4,617,264, Cl. 435-34.000.

Wico Corporation: *See—*
Geller, David A., 4,616,833, Cl. 273-313.000.

Wienand, Anneliese, legal representative: *See—*
Mewes, Heinz; Nachtigall, Wilhelm; Wienand, Michael, deceased; Wienand, Anneliese, legal representative; Wienand, Hans-Jurg W., heir; Wienand, Michael, heir; Wienand, Rudolf J., heir; Wienand, Karl F., heir; and Wienand, Elisabeth H. M., heir, 4,616,989, Cl. 425-203.000.

Wienand, Elisabeth H. M., heir: *See—*
Mewes, Heinz; Nachtigall, Wilhelm; Wienand, Michael, deceased; Wienand, Anneliese, legal representative; Wienand, Hans-Jurg W., heir; Wienand, Michael, heir; Wienand, Rudolf J., heir; Wienand, Karl F., heir; and Wienand, Elisabeth H. M., heir, 4,616,989, Cl. 425-203.000.

Wienand, Hans-Jurg W., heir: *See—*
Mewes, Heinz; Nachtigall, Wilhelm; Wienand, Michael, deceased; Wienand, Anneliese, legal representative; Wienand, Hans-Jurg W., heir; Wienand, Michael, heir; Wienand, Rudolf J., heir; Wienand, Karl F., heir; and Wienand, Elisabeth H. M., heir, 4,616,989, Cl. 425-203.000.

Wienand, Karl F., heir: *See—*
Mewes, Heinz; Nachtigall, Wilhelm; Wienand, Michael, deceased; Wienand, Anneliese, legal representative; Wienand, Hans-Jurg W., heir; Wienand, Michael, heir; Wienand, Rudolf J., heir; Wienand, Karl F., heir; and Wienand, Elisabeth H. M., heir, 4,616,989, Cl. 425-203.000.

Wienand, Michael, deceased: *See—*
Mewes, Heinz; Nachtigall, Wilhelm; Wienand, Michael, deceased; Wienand, Anneliese, legal representative; Wienand, Hans-Jurg W., heir; Wienand, Michael, heir; Wienand, Rudolf J., heir; Wienand, Karl F., heir; and Wienand, Elisabeth H. M., heir, 4,616,989, Cl. 425-203.000.

Wienand, Michael, heir: *See—*
Mewes, Heinz; Nachtigall, Wilhelm; Wienand, Michael, deceased; Wienand, Anneliese, legal representative; Wienand, Hans-Jurg W., heir; Wienand, Michael, heir; Wienand, Rudolf J., heir; Wienand, Karl F., heir; and Wienand, Elisabeth H. M., heir, 4,616,989, Cl. 425-203.000.

Wienand, Rudolf J., heir: *See—*
Mewes, Heinz; Nachtigall, Wilhelm; Wienand, Michael, deceased; Wienand, Anneliese, legal representative; Wienand, Hans-Jurg W., heir; Wienand, Michael, heir; Wienand, Rudolf J., heir; Wienand, Karl F., heir; and Wienand, Elisabeth H. M., heir, 4,616,989, Cl. 425-203.000.

Wiener, Charles; and Pittet, Alan O., to International Flavors & Fragrances Inc. Process for preparing natural benzaldehyde and acetaldehyde, natural benzaldehyde and acetaldehyde compositions, products produced thereby and organoleptic utilities therefor. 4,617,419, Cl. 568-464.000.

Wiener, Hans; and Undin, Hans, to C. A. Weidmuller GmbH & Co. Stripping device for coaxial cables. 4,616,533, Cl. 81-9.410.

Wigboma B.V.: *See—*
Oudman, Dirk J., 4,616,887, Cl. 312-140.100.

Wigoda, Luis. Lock for retractor apparatus. 4,616,632, Cl. 128-20.000.

Willging, Stephen M., to Henkel Corporation. Purification of tocopherols. 4,617,406, Cl. 549-413.000.

Williams, Paul D. Interchangeable sight mount for bows. 4,616,623, Cl. 124-87.000.

Wilson, Austin F.: *See—*
Bullock, Donald F.; Wilson, Austin F.; Lemay, Marshall A.; and Miles, David B., 4,617,514, Cl. 324-137.000.

Wilson, Harold R.: *See—*
Smeenge, Paul A.; Wilson, Harold R.; and Nelsen, Randy P., 4,616,798, Cl. 248-281.100.

Wiltronix Corporation: *See—*
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Wingler, Frank: *See—*
Ullrich, Martin; Hederich, Manfred; and Wingler, Frank, 4,617,089, Cl. 159-43.100.

Winkler, Hans-Henning: *See—*
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Kubis, Heribert; and Winter, Josef, 4,616,603, Cl. 123-41.840.

Witco Corporation: *See—*
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Witucki, Edward F.: *See—*
Newman, Paul R.; Warren, Leslie F., Jr.; and Witucki, Edward F., 4,617,228, Cl. 428-265.000.

Witzel, Karlheinz: *See—*
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Wogman, Ned A.: *See—*
Brodzinski, Ronald L.; Perkins, Richard W.; Rieck, Henry G.; and Wogman, Ned A., 4,617,169, Cl. 376-257.000.

Wolf, Alfred P.: *See—*
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Wolf, Horst, to Zinser Textilmaschinen GmbH. Spinning or twisting machine control system. 4,617,497, Cl. 318-78.000.

Wolf, Stephen J.: *See—*
Saferstein, Lowell; Lindquist, Julius A.; and Wolf, Stephen J., 4,616,644, Cl. 128-156.000.

Wolff, Erich; Langen, Hans; and Braden, Rudolf, to Agfa Gevaert Aktiengesellschaft. Color coupler-containing photographic material. 4,617,255, Cl. 430-553.000.

Wollenberg, Robert H., to Chevron Research Company. Modified succinimides (II). 4,617,138, Cl. 252-51.50A.

Wolters, Gerd-Michael: *See—*
Deutschmann, Herbert; and Wolters, Gerd-Michael, 4,616,480, Cl. 60-600.000.

Wolverine Tube, Inc.: *See—*
Cunningham, James L.; and Campbell, Bonnie J., 4,616,391, Cl. 29-157.3AH.

Wong, Brian W. Face bow and method of use in orthodontic procedures. 4,616,998, Cl. 433-73.000.

Wong, Sau-Ching: *See—*
Hartmann, Robert F.; Wong, Sau-Ching; Chan, Yiu-Fai; and Ou, Jung-Hsing, 4,617,479, Cl. 307-465.000.

Wood, Edgar C., Jr.: *See—*
Axford, Robert A.; Wood, Edgar C., Jr.; and Brandana, Herbert F., 4,616,537, Cl. 82-5.000.

Wood, John R.; Siska, Margaret M.; and Raymond, Patrick A., to Hydril Company. Automatic well test system and method. 4,616,700, Cl. 166-250.000.

Wood, Robert F.; and Vanderveer, William R., to Fabcon, Inc. Stock washer. 4,616,489, Cl. 68-200.000.

Woodman, Daniel C.; and Neely, Stephen A., to Hughes Tool Company. Bi-directional self-retaining cylindrical surface seal. 4,616,857, Cl. 285-140.000.

World Inventions: *See—*
Smack, Melvin F., Sr.; and Semien, Garland J., Jr., 4,616,829, Cl. 273-86.00B.

Wormald International, Limited: *See—*
Mackle, Michael T., 4,616,865, Cl. 292-341.160.

Wortel, Theodorus M.: *See—*
van der Vleugel, Dominicus J. M.; Hoving, Klaas; Wortel, Theodorus M.; Rosensweig, Ronald E.; and Rees, Lovat V. C., 4,617,282, Cl. 502-66.000.

Wowczuk, Andrew: *See—*
Harman, Douglas G.; Veronesi, Luciano; and Wowczuk, Andrew, 4,616,497, Cl. 72-53.000.

Wrap & Roll, Inc.: *See—*
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Wu, Andrew L., to Digital Equipment Corporation. Planar interconnect for integrated circuits. 4,617,193, Cl. 427-38.000.

Wu, Ray J.: *See—*
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Wuerzer, Bruno: *See—*
Jahn, Dieter; Becker, Rainer; Keil, Michael; Himmele, Walter; and Wuerzer, Bruno, 4,617,050, Cl. 71-98.000.

Wursthorn, Karl R.: *See—*
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Wurz, Joachim: *See—*
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Wyatt, Philip J.: *See—*
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Wyatt Technology Corporation: *See—*
Phillips, Steven D.; Reece, Jeffrey M.; and Wyatt, Philip J., 4,616,927, Cl. 356-338.000.

Wyvratt, Matthew J., Jr.: *See—*
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Xerox Corporation: *See—*
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Xicor, Inc.: *See—*
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Y Technipak Corp.: *See—*
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Yabe, Jinzo: *See—*
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Yagi Antenna Co., Ltd.: *See—*
Nakata, Yukio; Suda, Kaoru; Shiotsu, Osamu; and Morito, Motoyoshi, 4,617,565, Cl. 340-825.500.

Yamada, Hideaki; Otsuji, Shogo; Isobe, Kimiyasu; Matsunaga, Kuniyoshi; and Inukai, Tadahiko, to Amano Seiyaku Kabushiki Kaisha. Method for quantitative determination of acetylputrescine in a mixture. 4,617,263, Cl. 435-25.000.

Yamada, Masanori: *See—*
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Yamada, Shigemichi: *See—*
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Yamaguchi, Nobutaka; Utumi, Masahiro; Fujiyama, Masaaki; and Miyoshi, Takahito, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,617,226, Cl. 428-216.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See—*
Kasai, Yasuhiro, 4,616,729, Cl. 180-231.000.

Yamamuro, Sigeaki: *See—*
Tanaka, Yoshikazu; Kumura, Haruyoshi; Abo, Keiju; Yamamuro, Sigeaki; and Hirano, Hiroyuki, 4,616,530, Cl. 74-851.000.

Yamanami, Tsuguya: *See—*
Taguchi, Yoshinori; and Yamanami, Tsuguya, 4,617,515, Cl. 324-207.000.

Yamauchi, Masahide; and Hirose, Minoru, to Kabushiki Kaisha Toshiba. Paper sheet dispensing apparatus. 4,616,817, Cl. 271-9.000.

Yamazaki, Hiroyuki: *See—*
Hikawa, Kazuo; Toyomaki, Kazuya; and Yamazaki, Hiroyuki, 4,617,526, Cl. 331-1.00A.

Yamazaki, Yukinori, to Nihon Cement Co., Ltd. Demolition agent for brittle materials. 4,617,059, Cl. 106-118.000.

Yang, Kei-Hsiung, to International Business Machines Corporation. Electric field gradient excited liquid crystal cell having bistability. 4,617,646, Cl. 365-108.000.

Yang, Tai-Her. Exercise bicycle with inclined seats for two people. 4,616,823, Cl. 272-73.000.

Yano, Kazunori; Goto, Teruhisa; and Abe, Katsuhiro, to Mitsubishi Petrochemical Co, Ltd. Process for producing polyphenylene ether. 4,617,372, Cl. 528-216.000.

Yardley, James T.: *See—*
Gupta, Arunava; West, Gary A.; and Yardley, James T., 4,617,237, Cl. 428-446.000.

Yasuda, Kenji, to Hitachi Zosen Corporation. Method of recovering heat of reaction. 4,616,692, Cl. 165-1.000.

Yasuda, Yasuo, to Plus Corporation. Stapler. 4,616,774, Cl. 227-113.000.

Yasuhara, Seishi: *See—*
Kawaguchi, Hiroyuki; Saito, Hideyuki; and Yasuhara, Seishi, 4,616,615, Cl. 123-339.000.

Yasui, Mitsuru, to Tokyo Shibaura Denki Kabushiki Kaisha. Plastic enclosing device. 4,617,585, Cl. 357-72.000.

Yasukawa, Hiroshi, to Niigata Engineering Co., Ltd. Magazine for replaceable tools and operation method of indexing tools using the magazine. 4,616,397, Cl. 29-568.000.

Yasunobu, Seiji; Miyamoto, Shoji; and Ihara, Hirokazu, to Hitachi, Ltd. Method for automatic operation of a vehicle. 4,617,627, Cl. 364-426.000.

Yasuoka, Hideki, to Hitachi, Ltd. Semiconductor device and manufacturing method thereof. 4,616,405, Cl. 29-578.000.

Yates, Donald N., Jr., to Halliburton Company. Secondary high explosive booster, and method of making and method of using same. 4,616,566, Cl. 102-318.000.

Yazu, Shuji; and Satoh, Shuichi, to Sumitomo Electric Industries, Ltd. Synthetic diamond heat sink. 4,617,181, Cl. 423-446.000.

Yeda Research and Development Co., Ltd.: *See—*
Rubinstein, Menachem; Friedlander, Jossef; and Fischer, Dina, 4,617,378, Cl. 530-351.000.

Yoder, Andrew H.; and Rhodes, Richard A., to KemStone Manufacturing, Inc. Enhanced safety flue construction. 4,616,457, Cl. 52-218.000.

Yokota, Akihiro: *See—*
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Yokoya, Hisao: *See—*
Takahashi, Kenzo; Kumazaki, Nobuo; Yokoya, Hisao; Nakamura, Hironobu; and Kachi, Tadakatsu, 4,616,695, Cl. 165-54.000.

Yokoyama, Naoshi, to Nitco, Inc. In-tank pump filter for automobile fuel tank. 4,617,121, Cl. 210-416.400.

Yorita, Masaru: *See—*
Furuya, Kunitaka; Inagaki, Hiromi; Koga, Kiyoshi; Yorita, Masaru; Fukatsu, Tsunehiko; and Matsuura, Kazuo, 4,616,846, Cl. 280-673.000.

Yoshida Kogyo K. K.: *See—*
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Kawamura, Kaoru; and Iwaki, Yuichi, 4,616,593, Cl. 118-303.000.

Yoshida, Tadashi; Shimizu, Katsuichi; Arimoto, Shinobu; Maeshima, Katsuyoshi; Nagashima, Nao; and Watanabe, Asao, to Canon Kabushiki Kaisha. Image processing apparatus. 4,617,596, Cl. 358-280.000.

Yoshida, Tokuichiro. Magnetically operated power transmission apparatus. 4,616,519, Cl. 74-191.000.

Yoshida, Yuzo, to Kabushiki Kaisha Toshiba. Radiation detector vessel. 4,617,465, Cl. 250-385.000.

Yoshikawa, Akihisa: *See*—
Oneyama, Naotake; and Yoshikawa, Akihisa, 4,616,476, Cl. 60-414.000.

Yoshino, Akira, to Daidousanso Co., Ltd. Highly pure nitrogen gas producing apparatus. 4,617,040, Cl. 62-37.000.

Yoshioka, Yoshikazu, to International Business Machines Corporation. Graphic display system with display line scan based other than power of 2 refresh memory based on power of 2. 4,617,564, Cl. 340-798.000.

Yoshitomi Pharmaceutical Industries Ltd.: *See*—
Tahara, Tetsuya; Hayano, Kiyoharu; Setoguchi, Michihide; and Fukuda, Takemi, 4,617,314, Cl. 514-422.000.

Yoshizaki, Tsutomu; and Ishii, Toshimasa, to Fujitsu Limited. Integrated circuit socket. 4,616,895, Cl. 339-17.0CF.

Yotsuyanagi, Junji: *See*—
Miyauchi, Otohiko; Ohkawachi, Michihiro; and Yotsuyanagi, Junji, 4,616,766, Cl. 220-450.000.

Young, James R., to United States of America, Navy. Pseudo-random noise generator. 4,617,530, Cl. 331-78.000.

Young, Robert N.; and Rokach, Joshua, to Merck Frosst Canada, Inc. Leukotriene antagonists. 4,617,407, Cl. 549-462.000.

Yrizarris, Raymond D. Carpet seaming tool. 4,617,083, Cl. 156-545.000.

Yuasa, Masami, to Sony Corporation. Brushless motor. 4,617,499, Cl. 318-254.000.

YWHC, Inc.: *See*—
Thieme, Horst R., 4,616,778, Cl. 236-58.000.

Zahnradfabrik Friedrichshafen Aktiengesellschaft: *See*—
Ehrlinger, Friedrich; Katzorek, Karl-Hermann; Dziuba, Peter; Veser, Karl; and Caspar, Peter, 4,616,520, Cl. 74-325.000.

Zechmeister, Hartwin: *See*—
Amende, Welf; Lausch, Wolfram; and Zechmeister, Hartwin, 4,617,070, Cl. 148-152.000.

Zenith Electronics Corporation: *See*—
Krause, Charles A.; and Vander Heyden, Randy J., 4,617,554, Cl. 340-365.00E.

Zeth, Ulrich; Rempke, Wilfried; and Voigt, Klaus-Ditmar, to Jenoptik Jena G.m.b.H. Method for a non-retarded shutter release of rotary shutters in photogrammetric aerial cameras. 4,616,911, Cl. 354-66.000.

ZF-Herion Systemtechnik GmbH: *See*—
Heinemann, Fritz, 4,616,529, Cl. 74-640.000.

Zieske, William E.: *See*—
Mehdi, Syed A.; Zieske, William E.; and Ward, David R., 4,616,484, Cl. 62-180.000.

Zilog, Inc.: *See*—
Dalrymple, Monte J., 4,617,476, Cl. 307-443.000.

Zilske, Wolfgang: *See*—
Kuhn, Werner; and Zilske, Wolfgang, 4,617,096, Cl. 204-44.300.

Zimmerman, Gustavus H., III: *See*—
Prezas, Dimitrios P.; and Zimmerman, Gustavus H., III, 4,616,659, Cl. 128-706.000.

Zimmerman, Marlin. Hair piece storage and carrying case. 4,616,747, Cl. 206-8.000.

Zimmermann, Anso, to Rotpunkt Dr. Anso Zimmermann. Insulating container, in particular insulating bottle. 4,616,758, Cl. 215-13.00R.

Zinser Textilmaschinen GmbH: *See*—
Wolf, Horst, 4,617,497, Cl. 318-78.000.

Zipperian, Donald E.: *See*—
Christophersen, John A.; Marquardt, Fred J.; and Zipperian, Donald E., 4,617,113, Cl. 209-170.000.

Zotter, Johann: *See*—
Freisinger, Henry; Luschnig, Franz; Stritzl, Karl; and Zotter, Johann, 4,616,843, Cl. 280-618.000.

Zouch, Edward T.: *See*—
Harwood-Nash, Derek C.; Fitz, Charles R.; Zouch, Edward T.; and Smith, John M., 4,616,814, Cl. 269-328.000.

Zrnich, Milan, to GTE Communication Systems Corp. Printed wiring board retainer. 4,617,610, Cl. 361-415.000.

Zuckler, Karl, to Siemens Aktiengesellschaft. Contact arrangement for a vacuum interrupter. 4,617,434, Cl. 200-144.00B.

Zumbach Electronic AG: *See*—
Studer, Urs-Peter, 4,616,931, Cl. 356-373.000.

Zwicke, Philip E.; Rosenbush, David M.; and Couch, Robert P., to United Technologies Corporation. Expandable electrostatic engine diagnostics classifier. 4,617,628, Cl. 364-431.020.

Zwicke, Philip E.; Rosenbush, David M.; and Couch, Robert P., to United Technologies Corporation. System fault discriminating electrostatic engine diagnostics. 4,617,630, Cl. 364-431.020.

Zwicke, Philip E.; Rosenbush, David M.; and Couch, Robert P., to United Technologies Corporation. Waveform discriminated electrostatic engine diagnostics. 4,617,632, Cl. 364-431.020.

Zwicke, Philip E.: *See*—
Rosenbush, David M.; Zwicke, Philip E.; and Couch, Robert P., 4,617,631, Cl. 364-431.020.

Zybko, Walter C., to Burlington Industries, Inc. Self sticking carpet tiles. 4,617,210, Cl. 428-35.000.

Zydzik, George J.: *See*—
Chin, Aland K.; Singh, Shobha; Uitert, LeGrand G. V.; and Zydzik, George J., 4,617,192, Cl. 427-42.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 14TH DAY OF OCTOBER, 1986

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Applications Mechaniques et Robinetterie Industrielle (AMRI S.A.): *See*—
Bonafous, Maurice, Re. 32,264, Cl. 277-163.000.

Bonafous, Maurice, to Applications Mechaniques et Robinetterie Industrielle (AMRI S.A.). Double toric sealing ring. Re. 32,264, Cl. 277-163.000.

Lummus Crest, Inc.: *See*—
Unger, Harold; Sze, Morgan C.; and Van Dreisen, Roger P., Re. 32,265, Cl. 208-59.000.

Sze, Morgan C.: *See*—
Unger, Harold; Sze, Morgan C.; and Van Dreisen, Roger P., Re. 32,265, Cl. 208-59.000.

Unger, Harold; Sze, Morgan C.; and Van Dreisen, Roger P., to Lummus Crest, Inc. Hydrogenation of high boiling hydrocarbons. Re. 32,265, Cl. 208-59.000.

Van Dreisen, Roger P.: *See*—
Unger, Harold; Sze, Morgan C.; and Van Dreisen, Roger P., Re. 32,265, Cl. 208-59.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Bachler, Werner; Forth, Hans-Joachim; and Frank, Rudiger, to Leybold-Heraeus GmbH & Co. KG. Cryopump having improved heat radiation shielding. B1 4,121,430, 10-14-86, Cl. 62-55.500.

Biox Technology, Inc.: *See*—
Wilber, Scott A., B1 4,407,290, Cl. 128-633.000.

Forth, Hans-Joachim: *See*—
Bachler, Werner; Forth, Hans-Joachim; and Frank, Rudiger, B1 4,121,430, Cl. 62-55.500.

Frank, Rudiger: *See*—
Bachler, Werner; Forth, Hans-Joachim; and Frank, Rudiger, B1 4,121,430, Cl. 62-55.500.

Leybold-Heraeus GmbH & Co. KG: *See*—
Bachler, Werner; Forth, Hans-Joachim; and Frank, Rudiger, B1 4,121,430, Cl. 62-55.500.

Lloyd, Lawrence L. Mower cutting unit. B1 4,494,365, 10-14-86, Cl. 56-256.000.

Maurer, Donald D.; and Sorenson, Paul D., to Medtronic, Inc. Electrical stimulation system. B1 4,019,518, 10-14-86, Cl. 128-419.00R.

Medtronic, Inc.: *See*—
Maurer, Donald D.; and Sorenson, Paul D., B1 4,019,518, Cl. 128-419.00R.

Muncie Power Products, Inc.: *See*—
Schlosser, Paul W., B1 3,449,911, Cl. 60-453.000.

Rodgers, Henry W. Rotating circular airfoil. B1 4,104,822, 10-14-86, Cl. 446-48.000.

Schlosser, Paul W., to Muncie Power Products, Inc. Power transfer system. B1 3,449,911, 10-14-86, Cl. 60-453.000.

Sorenson, Paul D.: *See*—
Maurer, Donald D.; and Sorenson, Paul D., B1 4,019,518, Cl. 128-419.00R.

Wilber, Scott A., to Biox Technology, Inc. Blood constituent measuring device and method. B1 4,407,290, 10-14-86, Cl. 128-633.000.

LIST OF DESIGN PATENTEES

Abe, Noboru; and Seiffert, Florian, to Matsushita Electric Works, Ltd. Electric shaver. 286,210, 10-14-86, Cl. D28-49.000.

Advanced Matrix Technology, Inc.: *See*—
Moggridge, William G.; Hobson, Stephen R.; May, Eric E.; and Sherick, Michael T., 286,154, Cl. D14-111.000.

Aktiebolaget Volvo: *See*—
Sandberg, Ulf A., 286,145, Cl. D12-211.000.

Albery, Lewis L., to Cooperative Marketing Co., The. Holder for pamphlets or the like. 286,113, 10-14-86, Cl. D6-475.000.

Alternate Resources Limited: *See*—
Rooney, James, 286,165, Cl. D19-75.000.

Arthur Edward Pty. Ltd.: *See*—
Woodleigh, Ronald J., 286,101, Cl. D29-15.000.

Aspri Sports, Inc.: *See*—
Lowe, Ralph L., Jr., 286,102, Cl. D2-309.000.

AT&T Technologies, Inc.: *See*—
Cooke, Kenneth R.; and Porcelli, Vito L., 286,150, Cl. D14-60.000.

Attey, Graeme S. Sailboard boom. 286,146, 10-14-86, Cl. D12-317.000.

Baggiolini, Deris: *See*—
Campello, Ugo; Racca, Enrico; Sosta, Pierluigi; and Baggiolini, Deris, 286,212, Cl. D28-83.000.

Baldwin, Donald C.; Loy, Robert E.; and Willis, Paul E., to Dresser Industries, Inc. Road planer. 286,158, 10-14-86, Cl. D15-23.000.

Bancroft, Joseph C. Frame head extrusion. 286,184, 10-14-86, Cl. D25-74.000.

Bancroft, Joseph C. Frame sill extrusion. 286,185, 10-14-86, Cl. D25-74.000.

Bancroft, Joseph C. Meeting rail extrusion. 286,186, 10-14-86, Cl. D25-74.000.

Bancroft, Joseph C. Meeting rail extrusion. 286,187, 10-14-86, Cl. D25-74.000.

Bancroft, Joseph C. Frame jamb extrusion. 286,188, 10-14-86, Cl. D25-74.000.

Bancroft, Joseph C. Frame sill extrusion. 286,189, 10-14-86, Cl. D25-74.000.

Bancroft, Joseph C. Frame jamb extrusion. 286,190, 10-14-86, Cl. D25-74.000.

Bancroft, Joseph C. Frame head-fin extrusion. 286,191, 10-14-86, Cl. D25-74.000.

Bancroft, Joseph C. Fixed jamb. 286,192, 10-14-86, Cl. D25-74.000.

Bancroft, Joseph C. Frame insert - head. 286,193, 10-14-86, Cl. D25-74.000.

Bancroft, Joseph C. Vent head and sill. 286,194, 10-14-86, Cl. D25-74.000.

Bancroft, Joseph C. Frame insert sill. 286,195, 10-14-86, Cl. D25-74.000.

Bancroft, Joseph C. Frame head. 286,196, 10-14-86, Cl. D25-74.000.

Bancroft, Joseph C. Latch jamb. 286,197, 10-14-86, Cl. D25-74.000.

Bancroft, Joseph C. Vent latch jamb. 286,198, 10-14-86, Cl. D25-74.000.

Bancroft, Joseph C. Frame sill standard. 286,199, 10-14-86, Cl. D25-74.000.

Bancroft, Joseph C. Frame latch jamb. 286,200, 10-14-86, Cl. D25-74.000.

Bancroft, Joseph C. Frame sill. 286,201, 10-14-86, Cl. D25-74.000.

Bartlett, Randall N.: *See*—
Case, Robert; Jenkins, Arden; Bartlett, Randall N.; and Patrick, Ernest, 286,177, Cl. D24-5.000.

Baus, Heinz G. Panel for a shower partition. 286,173, 10-14-86, Cl. D23-64.000.

Bianchi International: *See*—
Nichols, Richard D. E., 286,171, Cl. D3-101.000.

Blumenthal, Martin. Toolbox/workshop. 286,103, 10-14-86, Cl. D3-73.000.

Bosland, James M., to Ketcham & McDougall, Inc. Directory shelf. 286,114, 10-14-86, Cl. D6-477.000.

Bowen, Robert F.; Herbst, Walter B.; and Salisbury, Thomas E., to Raytheon Company. Combined roasting rack and turntable for microwave oven. 286,128, 10-14-86, Cl. D7-351.000.

Bowen, Robert F.; Herbst, Walter B.; and Salisbury, Thomas E., to Raytheon Company. Microwave roasting rack or the like. 286,129, 10-14-86, Cl. D7-351.000.

Bowen, Robert F.; Herbst, Walter B.; and Salisbury, Thomas E., to Raytheon Company. Turntable for microwave oven. 286,130, 10-14-86, Cl. D7-351.000.

Bradshaw, Larry R.: *See—*
Womack, Darryl L.; Noell, Ralph B.; and Bradshaw, Larry R., 286,183, Cl. D24-64.000.

Breece, William N. Two piece door unit for a vehicle. 286,144, 10-14-86, Cl. D12-196.000.

Broderna Holmbergs Fabriks AB: *See—*
Foldi, Peter; and Carselid, Hans, 286,142, Cl. D10-83.000.

Cable Electric Products, Inc.: *See—*
Schwartz, Frederic W., 286,134, Cl. D8-358.000.

Camens, Murray I. C., to U.S. Philips Corporation. Hair-dryer. 286,209, 10-14-86, Cl. D28-13.000.

Campello, Ugo; Racca, Enrico; Sosta, Pierluigi; and Baggiolini, Deris, to New High Glass. Multicompartment compact. 286,212, 10-14-86, Cl. D28-83.000.

Canon Kabushiki Kaisha: *See—*
Masaki, Nobuo, 286,159, Cl. D16-31.000.
Nibley, Richard; and Haranishi, Noriaki, 286,162, Cl. D18-12.000.

Carlson, John A. Deck plate. 286,147, 10-14-86, Cl. D12-317.000.

Carselid, Hans: *See—*
Foldi, Peter; and Carselid, Hans, 286,142, Cl. D10-83.000.

Carvel Corporation: *See—*
Carvel, Thomas, 286,110, Cl. D6-471.000.

Carvel, Thomas, to Carvel Corporation. Counter display unit. 286,110, 10-14-86, Cl. D6-471.000.

Case, Robert; Jenkins, Arden; Bartlett, Randall N.; and Patrick, Ernest, to Syntex (U.S.A.) Inc. Cabinet door. 286,177, 10-14-86, Cl. D24-5.000.

Catania, Joseph J.; Gaudino, Angelo; DeTuzzi, Russell; and Gardner, Maxwell, to Century Fireplace Furnishings, Inc. Fireplace screen. 286,176, 10-14-86, Cl. D23-138.300.

Century Fireplace Furnishings, Inc.: *See—*
Catania, Joseph J.; Gaudino, Angelo; DeTuzzi, Russell; and Gardner, Maxwell, 286,176, Cl. D23-138.300.

Chan, Bing Y., to Goodway Electrical Co., Ltd. Iron. 286,214, 10-14-86, Cl. D32-69.000.

Chiaphua Industries: *See—*
Pataki, Robert, 286,215, Cl. D32-70.000.

Chiaphua Industries, Ltd.: *See—*
Pataki, Robert, 286,216, Cl. D32-70.000.

Coffee Enterprises, Inc.: *See—*
Cosby, Richard M.; and Lindsey, David A., 286,109, Cl. D6-469.000.

Colleen Pencil Co., Ltd.: *See—*
Shintani, Koichi, 286,163, Cl. D19-43.000.

Colleuil, Jacqueline P. Exerciser. 286,170, 10-14-86, Cl. D21-191.000.

Colliver, Joe E. Miniature coffin cigarette case. 286,207, 10-14-86, Cl. D27-50.000.

Cooke, Kenneth R.; and Porcelli, Vito L., to AT&T Technologies, Inc. Telephone instrument base. 286,150, 10-14-86, Cl. D14-60.000.

Cooperative Marketing Co., The: *See—*
Albery, Lewis L., 286,113, Cl. D6-475.000.

Cosby, Richard M.; and Lindsey, David A., to Coffee Enterprises, Inc. Dispenser for cups and packaged materials. 286,109, 10-14-86, Cl. D6-469.000.

Crane, Douglas A.: *See—*
Crane, Stephen A.; Crane, Howard A.; Crane, Douglas A.; and Crane, Timothy J., 286,203, Cl. D26-39.000.

Crane, Howard A.: *See—*
Crane, Stephen A.; Crane, Howard A.; Crane, Douglas A.; and Crane, Timothy J., 286,203, Cl. D26-39.000.

Crane Manufacturing & Plastics Corp.: *See—*
Crane, Stephen A.; Crane, Howard A.; Crane, Douglas A.; and Crane, Timothy J., 286,203, Cl. D26-39.000.

Crane, Stephen A.; Crane, Howard A.; Crane, Douglas A.; and Crane, Timothy J., to Crane Manufacturing & Plastics Corp. Combined head lamp and mounting bracket for fireman's helmet. 286,203, 10-14-86, Cl. D26-39.000.

Crane, Timothy J.: *See—*
Crane, Stephen A.; Crane, Howard A.; Crane, Douglas A.; and Crane, Timothy J., 286,203, Cl. D26-39.000.

Creative S.r.l.: *See—*
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Dart Industries Inc: *See—*
Wolff, Martin J., 286,121, Cl. D6-553.000.

Data General Corporation: *See—*
Gundogan, Can I., 286,155, Cl. D14-113.000.

Davis, Myron F., to International Business Machines Corporation. Printer. 286,153, 10-14-86, Cl. D14-111.000.

Dempsey, Lavell D. Lazy susan with refrigerated compartment. 286,124, 10-14-86, Cl. D7-2.000.

Dennison Manufacturing Company: *See—*
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Design Institute America, Inc.: *See—*
Evans, Paul R., 286,115, Cl. D6-478.000.

DeTuzzi, Russell: *See—*
Catania, Joseph J.; Gaudino, Angelo; DeTuzzi, Russell; and Gardner, Maxwell, 286,176, Cl. D23-138.300.

Dickie, Robert G., to Northern Technologies Ltd. Electrical connector cover. 286,148, 10-14-86, Cl. D13-24.000.

Dresser Industries, Inc.: *See—*
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Driscoll, Paul J., to W. R. Vermillion Co., Inc. Bread box. 286,126, 10-14-86, Cl. D7-82.000.

Dryburgh, Ian H.; and Murdoch, Peter N. G., to Venesta International Components Limited. Lavatory cubicle door sliding bolt. 286,133, 10-14-86, Cl. D8-341.000.

Enquist, Harold. Ski rack. 286,119, 10-14-86, Cl. D6-552.000.

Evans, Paul R., to Design Institute America, Inc. Shelf unit. 286,115, 10-14-86, Cl. D6-478.000.

Far East United Electronics Limited: *See—*
Wong, Chambers, 286,161, Cl. D18-2.000.

Finkel Outdoor Products, Inc.: *See—*
Tegze, Joseph F., 286,116, Cl. D6-495.000.

Flying Dragon Metal Products Factory: *See—*
Poon, Tit-Wing, 286,204, Cl. D26-42.000.

Foldi, Peter; and Carselid, Hans, to Broderna Holmbergs Fabriks AB. Tension indicator for strap tensioners. 286,142, 10-14-86, Cl. D10-83.000.

Folio Inc.: *See—*
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Fortin, Barbara A.: *See—*
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Frahm, Carl E. Bottle case. 286,219, 10-14-86, Cl. D34-43.000.

Franck, Klaus; and Sauer, Werner, to Wilkhahn Wilkening & Hahne GmbH & Co. Arm-chair. 286,106, 10-14-86, Cl. D6-372.000.

Fratelli Guzzini S.p.A.: *See—*
Gecchelin, Bruno, 286,118, Cl. D6-519.000.

Friedman, Yechiel. Shopping cart. 286,218, 10-14-86, Cl. D34-17.000.

Gardner, Maxwell: *See—*
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Gaudino, Angelo: *See—*
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Gecchelin, Bruno, to Fratelli Guzzini S.p.A. Combined paper towel holder and shelf. 286,118, 10-14-86, Cl. D6-519.000.

Geissmann, Robert. Alembic. 286,178, 10-14-86, Cl. D24-8.000.

Goldman, Paul R., to Plycraft Inc. Adjustable armchair. 286,105, 10-14-86, Cl. D6-365.000.

Golias, Bernard J., to Metal Fabricating Corporation. Aerosol can display cabinet. 286,122, 10-14-86, Cl. D6-559.000.

Goodway Electrical Co., Ltd.: *See—*
Chan, Bing Y., 286,214, Cl. D32-69.000.

Greco, Lawrence S.: *See—*
Kodousek, George E.; and Greco, Lawrence S., 286,140, Cl. D9-418.000.

Greitzer, Morris. Tiered card holder. 286,167, 10-14-86, Cl. D21-54.000.

GTE Telenet Communications Corporation: *See—*
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Gundogan, Can I., to Data General Corporation. Video display terminal. 286,155, 10-14-86, Cl. D14-113.000.

Haas, Ulrich J., to Optyl Eyewear Fashion International Corporation. Eyeglass frame. 286,160, 10-14-86, Cl. D16-117.000.

Hanlon, Albert W., to Folio Inc. Display stand. 286,108, 10-14-86, Cl. D6-449.000.

Haranishi, Noriaki: *See—*
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Herbst, Walter B.: *See—*
Bowen, Robert F.; Herbst, Walter B.; and Salisbury, Thomas E., 286,128, Cl. D7-351.000.
Bowen, Robert F.; Herbst, Walter B.; and Salisbury, Thomas E., 286,129, Cl. D7-351.000.
Bowen, Robert F.; Herbst, Walter B.; and Salisbury, Thomas E., 286,130, Cl. D7-351.000.

Hilman, Robert S. Combined massage and acupressure disc. 286,182, 10-14-86, Cl. D24-36.000.

Hobson, Stephen R.: *See—*
Moggridge, William G.; Hobson, Stephen R.; May, Eric E.; and Sherick, Michael T., 286,154, Cl. D14-111.000.

Hodlewsky, Wasyly G.: *See—*
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Honda Giken Kogyo Kabushiki Kaisha: *See—*
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Huck, Charles M.; Johnson, Edward J.; and Lott, Jeremiah A., to Pfizer Inc. Combined pill dispenser and cover. 286,137, 10-14-86, Cl. D9-339.000.

Huffman, Ronald E., to Kv33 Corporation. Dental articulator with a ball mounting. 286,179, 10-14-86, Cl. D24-10.000.

International Business Machines Corporation: *See—*
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Ito, Jun: *See—*
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Jankowski, Michael T.; and Meelen, Hans T., to U.S. Philips Corporation. Lighting fixture. 286,205, 10-14-86, Cl. D26-65.000.

Jenkins, Arden: *See—*
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John Manufacturing Limited: *See—*
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Joosten, Stefanus F. W.; and Oosterheerd, Evert, to U.S. Philips Corporation. Lighting fixture. 286,206, 10-14-86, Cl. D26-85.000.
Kenna, Robert V., to Pfizer Hospital Products Group, Inc. Acetabular cup assembly prosthesis. 286,181, 10-14-86, Cl. D24-33.000.
Ketcham & McDougall, Inc.: *See—*
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Kodousek, George E.; and Greco, Lawrence S., to North American Philips Corporation. Blister package for a square reel. 286,140, 10-14-86, Cl. D9-418.000.
Koh-I-Noor Rapidograph, Inc.: *See—*
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Korthoff, Herbert W., to United States Surgical Corporation. Surgical fastener. 286,180, 10-14-86, Cl. D24-27.000.
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Lemkin, Jack L.; Zilber, Eugene A.; and Peterson, Carl A., to O.M. Scott & Sons Company, The. Tray for a garden watering set. 286,138, 10-14-86, Cl. D9-341.000.
Lindsey, David A.: *See—*
Cosby, Richard M.; and Lindsey, David A., 286,109, Cl. D6-469.000.
Looney, John W. Combined door stop and receptacle unit. 286,135, 10-14-86, Cl. D8-402.000.
Lott, Jeremiah A.: *See—*
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Loy, Robert E.: *See—*
Baldwin, Donald C.; Loy, Robert E.; and Willis, Paul E., 286,158, Cl. D15-23.000.
Lum, James C. P.: *See—*
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Lund Industries, Inc.: *See—*
Lund, James R., 286,143, Cl. D12-181.000.
Lund, James R., to Lund Industries, Inc. Air spoiler for pickup trucks. 286,143, 10-14-86, Cl. D12-181.000.
Maryyanek, Richard D.; and Zdrok, Joseph Z. Dual filter respirator. 286,213, 10-14-86, Cl. D29-7.000.
Masaki, Nobuo, to Canon Kabushiki Kaisha. Electrophotographic copier. 286,159, 10-14-86, Cl. D16-31.000.
Mastrodicasa, Arthur R. Adjustable shelving bracket. 286,156, 10-14-86, Cl. D8-381.000.
Matsui Manufacturing Co., Limited: *See—*
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Matsushita Electric Works, Ltd.: *See—*
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Moggridge, William G.; Hobson, Stephen R.; May, Eric E.; and Sherick, Michael T., 286,154, Cl. D14-111.000.
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Meelen, Hans T.: *See—*
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Mens, Gerardus F. Support for flower pots. 286,107, 10-14-86, Cl. D6-404.000.
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Mikado, Yoshio; Ito, Jun; and Ohsumi, Masayuki, to Honda Giken Kogyo Kabushiki Kaisha. Outboard engine. 286,157, 10-14-86, Cl. D15-4.000.
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Moggridge, William G.; Hobson, Stephen R.; May, Eric E.; and Sherick, Michael T., to Advanced Matrix Technology, Inc. Printer console. 286,154, 10-14-86, Cl. D14-111.000.
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Dryburgh, Ian H.; and Murdoch, Peter N. G., 286,133, Cl. D8-341.000.
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Nakamura, Kazuharu, to Toyotomi Kogyo Co., Ltd. Oil-fired space heater or similar article. 286,174, 10-14-86, Cl. D23-122.000.
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Nibley, Richard; and Haranishi, Noriaki, to Canon Kabushiki Kaisha. Type style cartridge for typewriter. 286,162, 10-14-86, Cl. D18-12.000.
Nichols, Richard D. E., to Bianchi International. Fabric holster. 286,171, 10-14-86, Cl. D3-101.000.
Noell, Ralph B.: *See—*
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North American Philips Corporation: *See—*
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Northern Technologies Ltd.: *See—*
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Norton, James A.; Murray, Brent W.; and Smith, Charles M., to Media Systems Technology, Inc. Micro-floppy disk copier machine. 286,152, 10-14-86, Cl. D14-107.000.
O.M. Scott & Sons Company, The: *See—*
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Ohno, Kouzin, to Takara Co., Ltd. Reconfigurable toy vehicle. 286,169, 10-14-86, Cl. D21-136.000.
Ohsumi, Masayuki: *See—*
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Optyl Eyewear Fashion International Corporation: *See—*
Haas, Ulrich J., 286,160, Cl. D16-117.000.
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Pataki, Robert, to Chiaphua Industries. Steam iron. 286,215, 10-14-86, Cl. D32-70.000.
Pataki, Robert, to Chiaphua Industries, Ltd. Steam iron. 286,216, 10-14-86, Cl. D32-70.000.
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Tegze, Joseph F., to Finkel Outdoor Products, Inc. Base for a garden umbrella. 286,116, 10-14-86, Cl. D6-495.000.
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Womack, Darryl L.; Noell, Ralph B.; and Bradshaw, Larry R., to Scott Orthopedics, Inc. Adjustable joint for a knee brace. 286,183, 10-14-86, Cl. D24-64.000.
Wong, Chambers, to Far East United Electronics Limited. Combined ruler, calculator and clock. 286,161, 10-14-86, Cl. D18-2.000.
Woodleigh, Ronald J., to Sunlea Developments Pty Ltd; and Arthur Edward Pty. Ltd. Spaceman's helmet. 286,101, 10-14-86, Cl. D29-15.000.
Yamamoto, Etsushi, to Ryobi Limited. Router. 286,131, 10-14-86, Cl. D8-67.000.
Yamamoto, Etsushi, to Ryobi Limited. Router. 286,132, 10-14-86, Cl. D8-67.000.
Yuen, John S., to John Manufacturing Limited. Combined spotlight and radio. 286,202, 10-14-86, Cl. D26-38.000.
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CLASSIFICATION OF PATENTS

ISSUED OCTOBER 14, 1986

NOTE.—First number, class; second number, subclass; third number, patent number

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250 R	4,616,376
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283.5	4,616,392
423	4,616,393
436	4,616,394
460	4,616,395
566.1	4,616,396
568	4,616,397
	4,616,398
571	4,616,399
	4,616,400
	4,616,401
	4,616,402
572	4,616,403
576 B	4,616,404
578	4,616,405
588	4,616,406
596	4,616,407
611	4,616,408
705	4,616,409
743	4,616,410
822	4,616,411
827	4,616,412
832	4,616,413
835	4,616,414
857	4,616,415
884	4,616,416

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265	4,616,422
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92	4,616,427

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7.2	4,616,429
14	4,616,430
28	4,616,431
50	4,616,432

CLASS 37

141 T	4,616,433

CLASS 38

140	4,616,434

CLASS 40

6	4,616,435
21 C	4,616,436

CLASS 43

17	4,616,437
24	4,616,438
36	4,616,439
42.12	4,616,440
44.91	4,616,441

CLASS 44

62	4,617,025
70	4,617,026

CLASS 47

45	4,616,442

CLASS 48

210	4,617,027

CLASS 49

252	4,616,443
347	4,616,444
374	4,616,445
441	4,616,446

CLASS 51

59 SS	4,616,447
215 H	4,616,448
273	4,616,449

CLASS 52

12	4,616,450
66	4,616,451
71	4,616,452
93	4,616,453
115	4,616,454
127.12	4,616,455
202	4,616,456
218	4,616,457
230	4,616,458
309.12	4,616,459
396	4,616,460
481	4,616,461
509	4,616,462
665	4,616,463
723	4,616,464
748	4,616,465

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75	4,616,466
134	4,616,467
391	4,616,468
410	4,616,469
412	4,616,470
442	4,616,471
459	4,616,472
520	4,616,473
556	4,616,474
575	4,616,475

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1	4,617,028
16	4,617,029
20	4,617,030
52	4,617,031
67	4,617,032
100	4,617,033
276	4,617,034
389	4,617,035

CLASS 56

256	B1 4,494,365

CLASS 60

414	4,616,476
415	4,616,477
453	B1 3,449,911
487	4,616,478
521	4,616,479
600	4,616,480
606	4,616,481
624	4,616,482

CLASS 62

11	4,617,036
	4,617,037
17	4,617,038
26	4,617,039
37	4,617,040
55.5	B1 4,121,430
115	4,616,483
180	4,616,484
228.1	4,616,485
235	4,616,486
235.1	4,616,487

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2	4,617,041
27	4,617,042
29	4,617,043
49	4,617,044
134	4,617,045
	4,617,046

CLASS 66

70	4,616,488

CLASS 68

200	4,616,489

CLASS 70

14	4,616,490
129	4,616,493
276	4,616,491
284	4,616,492

CLASS 71

5	4,617,047
30	4,617,048
88	4,617,049
98	4,617,050

CLASS 72

8	4,616,494
49	4,616,495
53	4,616,496
	4,616,497
	4,616,498
56	4,616,499
283	4,616,500

CLASS 73

24	4,616,501
35	4,616,502
55	4,616,503
118.1	4,616,504
204	4,616,505
	4,616,506
431	4,616,507
823	4,616,508
861.05	4,616,509
861.27	4,616,510
862.04	4,616,511
862.36	4,616,512
863.23	4,616,513
864.14	4,616,514
864.31	4,616,515

CLASS 74

10.33	4,616,516
10.45	4,616,517
96	4,616,518
191	4,616,519
325	4,616,520
335	4,616,521
492	4,616,522
501	4,616,523
553	4,616,524
606 R	4,616,525
	4,616,526
625	4,616,527
626	4,616,528
640	4,616,529
851	4,616,530
866	4,616,531
869	4,616,532

CLASS 75

91	4,617,051
244	4,617,053
246	4,617,054
251	4,617,055

CLASS 81

9.41	4,616,533
99	4,616,534
121.1	4,616,535
128	4,616,536

CLASS 82

5	4,616,537
40 R	4,616,538

CLASS 83

42	4,616,539
54	4,616,540
98	4,616,541
155	4,616,542
175	4,616,543
413	4,616,544
558	4,616,545

CLASS 84

1.01	4,616,546
1.03	4,616,547
1.16	4,616,548
94 R	4,616,549
173	4,616,550
411 A	4,616,551
414	4,616,552

CLASS 87

48	4,616,553

CLASS 89

1.806	4,616,554
33.02	4,616,555

CLASS 92

48	4,616,556

CLASS 98

31.5	4,616,557
40.11	4,616,558
	4,616,559
40.3	4,616,563
42.02	4,616,560
97	4,616,561
115.1	4,616,562

CLASS 101

143	4,616,564

CLASS 102

202.7	4,616,565
318	4,616,566
489	4,616,567
501	4,616,568
517	4,616,569

CLASS 104

172 B	4,616,570

CLASS 106

1.12	4,617,056
2	4,617,057
19	4,617,058
118	4,617,059
193 R	4,617,060
273 R	4,617,062
302	4,617,061

CLASS 108

111	4,616,571

CLASS 110

254	4,616,572
327	4,616,573
343	4,616,574
345	4,616,575
	4,616,576

CLASS 111

1	4,616,577
2	4,616,578
7	4,616,579
	4,616,580
85	4,616,581

CLASS 112

76	4,616,582
121.12	4,616,583
121.15	4,616,584
221	4,616,585
320	4,616,586

CLASS 114

29	4,616,587
162	4,616,588
210	4,616,589
230	4,616,590
347	4,616,591

CLASS 118

202	4,616,592
303	4,616,593
326	4,616,594
405	4,616,595
603	4,616,596
723	4,616,597

CLASS 119

1	4,616,598

CLASS 123

41.1	4,616,599
41.21	4,616,600
	4,616,601
41.27	4,616,602
41.84	4,616,603
55 AA	4,616,604
65 VD	4,616,605
90.17	4,616,606
90.46	4,616,607
192 B	4,616,608
196 A	4,616,610
196 AB	4,616,609
270	4,616,611
276	4,616,612
339	4,616,613
	4,616,614
	4,616,615
357	4,616,616
436	4,616,617
478	4,616,618
489	4,616,619
573	4,616,620
585	4,616,621

CLASS 124

73	4,616,622
87	4,616,623

CLASS 126

9 R	4,616,624
25 R	4,616,625
39 K	4,616,626
77	4,616,627
121	4,616,628

CLASS 128

1.5	4,616,629
4	4,616,630
6	4,616,631
20	4,616,632
	4,616,633
	4,616,634
	4,616,635
23	4,616,636
84 R	4,616,637
92 BB	4,616,638
99	4,616,639
130	4,616,640
132 D	4,616,642
132 R	4,616,641
151	4,616,643
156	4,616,644
204.26	4,616,645
205.24	4,616,646
206.19	4,616,647
303 R	4,616,648
314	4,616,649
325	4,616,650
	4,616,651
344	4,616,652
	4,616,653
391	4,616,654
419 P	4,616,655
419 R	B1 4,019,518
630	4,616,656
633	B1 4,407,290
664	4,616,657
691	4,616,658
706	4,616,659
741	4,616,660

CLASS 130

27 JT	4,616,661

CLASS 131

84.1	4,616,662
109.3	4,616,663
336	4,616,664
351	4,616,665

CLASS 132

9	4,616,666
89	4,616,667

CLASS 134

6	4,617,063
7	4,617,064
25.4	4,617,065

CLASS 135

75	4,616,668

CLASS 136

244	4,617,420
	4,617,421

CLASS 137

1	4,616,669
84	4,616,670
101	4,616,671
107	4,616,672
315	4,616,673
596.18	4,616,674
625.65	4,616,675
636.4	4,616,676
881	4,616,677
888	4,616,678

CLASS 138

96 T	4,616,679

CLASS 139

304	4,616,680
371	4,616,681

CLASS 140

71.5	4,616,682

CLASS 141

98	4,616,683
114	4,616,684

CLASS 148

1.5	4,617,066
2	4,617,067
6.14 R	4,617,068
138	4,617,069
152	4,617,070
188	4,617,071

CLASS 152

209 R	4,616,685
510	4,616,686
	4,616,687

CLASS 156

89	4,617,072
107	4,617,073
130	4,617,074
137	4,617,075
205	4,617,076
245	4,617,077
307.5	4,617,078
345	4,617,079
359	4,617,080
443	4,617,081
447	4,617,082
545	4,617,083
607	4,617,084
643	4,617,085
	4,617,086
	4,617,087
656	4,617,088

CLASS 159

43.1	4,617,089

CLASS 160

176 R	4,616,688

CLASS 162

16	4,617,090
343	4,617,091

CLASS 164

34	4,616,689
128	4,616,690
255	4,616,691

CLASS 165

1	4,616,692
41	4,616,693
47	4,616,694
54	4,616,695
	4,616,696
104.14	4,616,697
104.16	4,616,698
104.26	4,616,699

CLASS 166

55.1 4,616,701
65.1 4,616,702
66.4 4,616,703
242 4,616,704
250 4,616,700
4,616,705
341 4,616,706
345 4,616,707
355 4,616,708

CLASS 168

13 4,616,709

CLASS 169

41 4,616,710
45 4,616,711

CLASS 172

6 4,616,712
19 4,616,713
21 4,616,714
61 4,616,715

CLASS 173

49 4,616,716

CLASS 174

23 C 4,617,422
117 F 4,616,717

CLASS 175

4.54 4,616,718
94 4,616,719
267 4,616,720
320 4,616,721

CLASS 177

99 4,616,722
211 4,616,723

CLASS 178

2 R 4,617,423

CLASS 179

2 EA 4,617,424
6.11 4,617,425
16 AA 4,617,426
84 VF 4,617,427
100 C 4,617,428
107 E 4,617,429
146 R 4,617,430
156 A 4,617,431

CLASS 180

6.48 4,616,724
89.13 4,616,725
135 4,616,726
142 4,616,727
4,616,728
231 4,616,729
253 4,616,730

CLASS 181

148 4,616,731
232 4,616,732

CLASS 182

45 4,616,734
238 4,616,735

CLASS 184

6.12 4,616,736

CLASS 187

29 R 4,616,733

CLASS 188

184 4,616,737
380 4,616,738

CLASS 192

18 A 4,616,739
21.5 4,616,740
70.18 4,616,741
84 C 4,616,742
105 BA 4,616,743
109 R 4,616,744

CLASS 198

442 4,616,745
463.3 4,616,746

CLASS 200

81 R 4,617,432
86 R 4,617,433
144 AP 4,617,435
144 B 4,617,434
148 R 4,617,436
153 P 4,617,437

CLASS 203

1 4,617,092
100 4,617,093

CLASS 204

18.1 4,617,094
41 4,617,095
44.3 4,617,096
44.4 4,617,097
68 4,617,098
133 4,617,099
245 4,617,100
252 4,617,101
299 R 4,617,102
300 R 4,617,103
301 4,617,104

CLASS 206

8 4,616,747
214 4,616,748
315.2 4,616,749
316 4,616,750
485 4,616,751
533 4,616,752

CLASS 208

59 Re.32,265
111 4,617,108
130 4,617,109
211 4,617,110
412 4,617,105
418 4,617,106
427 4,617,107

CLASS 209

4 4,617,111
11 4,617,112
170 4,617,113
211 4,617,114

CLASS 210

90 4,617,115
137 4,617,116
198.1 4,617,117
232 4,617,118
321.3 4,617,119
409 4,617,120
416.4 4,617,121
493.3 4,617,122
611 4,617,123
638 4,617,124
4,617,125
651 4,617,126
4,617,127
679 4,617,128
700 4,617,129
748 4,617,130
794 4,617,131

CLASS 211

57.1 4,616,753
71 4,616,754
89 4,616,755
181 4,616,756
189 4,616,757

CLASS 215

13 R 4,616,758
228 4,616,759
232 4,616,760
271 4,616,761

CLASS 219

10.55 A 4,617,440
10.55 B 4,617,438
10.55 M 4,617,439
10.77 4,617,441
4,617,442
69 C 4,617,443
75 4,617,444
98 4,617,445
121 LC 4,617,446
124.31 4,617,447
200 4,617,448
301 4,617,449
345 4,617,450
441 4,617,452
490 4,617,451
501 4,617,453
505 4,617,454
523 4,617,455
4,617,456

CLASS 220

74 4,616,762
270 4,616,763
306 4,616,764
335 4,616,765
450 4,616,766

CLASS 221

58 4,616,767

CLASS 222

92 4,616,768

CLASS 223

46 4,616,769
101 4,616,770

CLASS 224

321 4,616,771
326 4,616,772

CLASS 225

99 4,616,773

CLASS 227

113 4,616,774

CLASS 228

37 4,616,775

CLASS 232

4 R 4,616,776

CLASS 235

379 4,617,457
449 4,617,458

CLASS 236

44 C 4,616,777
58 4,616,778

CLASS 239

79 4,616,779
113 4,616,780
124 4,616,781
216 4,616,783
404 4,616,784
752 4,616,782

CLASS 241

26 4,616,785
35 4,616,786
275 4,616,787

CLASS 242

7.03 4,616,788
35.5 R 4,616,789
85.1 4,616,790
86.2 4,616,791
218 4,616,792

CLASS 244

137 A 4,616,793

CLASS 248

67.5 4,616,794
103 4,616,795
206.5 4,616,796
230 4,616,797
281.1 4,616,798
289.3 4,616,799

CLASS 249

4 4,616,800

CLASS 250

201 4,617,459
227 4,617,460
229 4,617,461
251 4,617,462
342 4,617,463
377 4,617,464
385 4,617,465
390 4,617,466
461.1 4,617,467
484.1 4,617,468
548 4,617,469
561 4,617,470
578 4,617,471

CLASS 251

6 4,616,801
7 4,616,802
14 4,616,803
63.4 4,616,806
267 4,616,804
297 4,616,805

CLASS 252

8.554 4,617,132
32.5 4,617,133
32.7 E 4,617,134
33.2 4,617,135
47 4,617,136
49.6 4,617,137
51.5 A 4,617,138
135 4,617,139
299.61 4,617,140
299.63 4,617,141
4,617,142
500 4,617,143
522 A 4,617,144
4,617,147
522 R 4,617,145
4,617,146
547 4,617,148

CLASS 254

93 H 4,616,807

CLASS 260

413 4,617,153
501.12 4,617,155
513 R 4,617,156

CLASS 261

96 4,617,157

CLASS 264

0.5 4,617,158
16 4,617,159
40.1 4,617,160
136 4,617,161
176 R 4,617,162
235.6 4,617,163
235.8 4,617,164
236 4,617,165
531 4,617,166

CLASS 266

207 4,616,808
220 4,616,809

CLASS 267

8 R 4,616,810
35 4,616,811
131 4,616,812

CLASS 269

328 4,616,813
4,616,814

CLASS 270

45 4,616,815
58 4,616,816

CLASS 271

9 4,616,817
113 4,616,818
122 4,616,819
189 4,616,820
213 4,616,821

CLASS 272

69 4,616,822
73 4,616,823
86 4,616,824
134 4,616,825

CLASS 273

32.5 4,616,826
58 A 4,616,827
61 R 4,616,828
86 B 4,616,829
126 R 4,616,830
144 B 4,616,831
238 4,616,832
313 4,616,833
411 4,616,834
421 4,616,835

CLASS 277

152 4,616,836
153 4,616,837
163 Re.32,264

CLASS 279

4 4,616,838

CLASS 280

33.99 R 4,616,839
234 4,616,840
432 4,616,841
602 4,616,842
618 4,616,843
650 4,616,844
661 4,616,845
673 4,616,846
707 4,616,847
4,616,848
724 4,616,849
808 4,616,850

CLASS 281

15 R 4,616,851

CLASS 282

27 R 4,616,852

CLASS 283

60 A 4,616,853
74 4,616,854

CLASS 285

24 4,616,855
92 4,616,856
140 4,616,857
235 4,616,858
317 4,616,859
336 4,616,860

CLASS 292

6 4,616,861
201 4,616,862
302 4,616,863
336.3 4,616,864
341.16 4,616,865

CLASS 293

120 4,616,866

CLASS 294

55 4,616,867
137 4,616,868

CLASS 296

1 S 4,616,869
21 4,616,870
166 4,616,871
190 4,616,872

CLASS 297

272 4,616,873
321 4,616,874
325 4,616,875
328 4,616,876
353 4,616,877
483 4,616,878

CLASS 298

10 4,616,879

CLASS 299

39 4,616,880

CLASS 303

7 4,616,881
68 4,616,882

CLASS 305

40 4,616,883

CLASS 307

10 R 4,617,472
66 4,617,473
262 4,617,474
441 4,617,475
443 4,617,476
4,617,477
455 4,617,478
465 4,617,479
480 4,617,480
491 4,617,481
579 4,617,482

CLASS 310

10 4,617,483
51 4,617,484
65 4,617,485
233 4,617,486
313 D 4,617,487
321 4,617,488

CLASS 312

140.1 4,616,887
201 4,616,888
4,616,889
257 R 4,616,890
328 4,616,891
330 R 4,616,892

CLASS 313

13 4,617,489
478 4,617,490
497 4,617,491
630 4,617,492

CLASS 315

5 4,617,493
5.41 4,617,494
10 4,617,495
208 4,617,496

CLASS 318

78 4,617,497
85 4,617,498
254 4,617,499
305 4,617,500
459 4,617,501
568 4,617,502
572 4,617,503
576 4,617,504
626 4,617,505

CLASS 320

2 4,617,506

CLASS 322

4 4,617,507

CLASS 323

237 4,617,508
303 4,617,509

CLASS 324

51 4,617,510
54 4,617,511
60 CD 4,617,512
126 4,617,513
137 4,617,514
207 4,617,515
318 4,617,516
338 4,617,517
365 4,617,518
414 4,617,519

CLASS 328

133 4,617,520

CLASS 329

50 4,617,521

CLASS 330

149 4,617,522
261 4,617,523
307 4,617,524

CLASS 331

1 A 4,617,526
4 4,617,527
56 4,617,528
57 4,617,529
78 4,617,530
96 4,617,531
107 R 4,617,532
113 A 4,617,533
117 R 4,617,534

CLASS 332

16 R 4,617,535
37 D 4,617,536
48 4,617,537

CLASS 333

106 4,617,538
164 4,617,539

CLASS 335

35 4,617,540
133 4,617,541
196 4,617,542

CLASS 336

192 4,617,543

CLASS 337

3 4,617,544
74 4,617,545
170 4,617,546

CLASS 338

317 4,617,547
325 4,617,548

CLASS 339

14 R 4,616,893
15 4,616,894
17 C 4,616,896
17 CF 4,616,895
122 R 4,616,897

CLASS 340

347 AD 4,617,549
4,617,550
347 DA 4,617,551
347 DD 4,617,552
4,617,553
365 E 4,617,554
531 4,617,555
546 4,617,556
568 4,617,557
573 4,617,525
574 4,617,558
576 4,617,559
628 4,617,560
4,617,561
753 4,617,562
784 4,617,563
798 4,617,564
825.5 4,617,565
870.11 4,617,566

CLASS 342

25 4,617,567
160 4,617,568
412 4,617,569
429 4,617,570

CLASS 343

744 4,617,571
765 4,617,572
844 4,617,573

CLASS 346

75 4,617,574
76 PH 4,617,575
4,617,576
4,617,577
108 4,617,578
135.1 4,617,579
136 4,617,580
140 R 4,617,581
208 4,617,582

CLASS 350

96.15 4,616,898
96.18 4,616,899
96.20 4,616,900
96.34 4,616,901
316 4,616,902
334 4,616,903
432 4,616,904
4,616,905
486 4,616,906
552 4,616,907
576 4,616,908
613 4,616,909

CLASS 351

162 4,616,910

CLASS 354

66 4,616,911
80 4,616,912

173.1 4,616,913
277 4,616,914
320 4,616,915
442 4,616,916

CLASS 355

3 BE 4,616,920
3 DD 4,616,918
4,616,919
3 FU 4,616,917
5 4,616,921
14 E 4,616,923
14 R 4,616,922
15 4,616,924
44 4,616,925
45 4,616,926

CLASS 356

338 4,616,927
4,616,928
350 4,616,929
4,616,930
373 4,616,931
376 4,616,932
416 4,616,933

CLASS 357

38 4,617,583
72 4,617,584
4,617,585
80 4,617,586

CLASS 358

17 4,617,587
31 4,617,588
4,617,589
34 4,617,590
67 4,617,591
80 4,617,592
113 4,617,593
150 4,617,594
213 4,617,595
280 4,617,596
310 4,617,597

CLASS 360

10.3 4,617,598
32 4,617,599
113 4,617,600
131 4,617,601

CLASS 361

119 4,617,602
149 4,617,603
160 4,617,604
220 4,617,605
283 4,617,606
4,617,607
291 4,617,608
310 4,617,609
415 4,617,610
433 4,617,611

CLASS 362

33 4,617,612
95 4,617,613
212 4,617,614
216 4,617,615
267 4,617,616
4,617,617
341 4,617,618
804 4,617,619

CLASS 363

19 4,617,620
71 4,617,621
98 4,617,622

CLASS 364

167 4,617,623
200 4,617,624
4,617,625
424 4,617,626
426 4,617,627
431.02 4,617,628
4,617,629
4,617,630
4,617,631
4,617,632
434 4,617,633
455 4,617,634
474 4,617,635
482 4,617,636
505 4,617,637
557 4,617,638
569 4,617,639
708 4,617,640
748 4,617,641
900 4,617,642
4,617,643

CLASS 365

36 4,617,644
45 4,617,645
108 4,617,646
189 4,617,647
4,617,648
4,617,649
195 4,617,650
200 4,617,651
203 4,617,652
230 4,617,653

CLASS 366

4 4,616,934
165 4,616,935
193 4,616,936
336 4,616,937

CLASS 369

46 4,617,654
291 4,617,655

CLASS 370

60 4,617,657
74 4,617,656
84 4,617,658
100 4,617,659

CLASS 371

13 4,617,660
20 4,617,661
25 4,617,662
4,617,663
38 4,617,664

CLASS 372

18 4,617,665
22 4,617,666
35 4,617,667
59 4,617,668
70 4,617,669
104 4,617,670

CLASS 373

22 4,617,671
79 4,617,672
80 4,617,673

CLASS 374

38 4,616,938
44 4,616,939

CLASS 375

1 4,617,674
22 4,617,675
27 4,617,676
94 4,617,677
102 4,617,678
119 4,617,679

CLASS 376

153 4,617,167
247 4,617,168
257 4,617,169
438 4,617,170
446 4,617,171

CLASS 377

10 4,617,680

CLASS 378

34 4,617,681

CLASS 382

28 4,617,682

CLASS 383

63 4,617,683

CLASS 384

7 4,616,884
15 4,616,885
45 4,616,886
248 4,616,940

CLASS 400

120 4,616,941
196.1 4,616,942
247 4,616,943
692 4,616,944
697.1 4,616,945
704 4,616,946

CLASS 401

69 4,616,947

CLASS 403

5 4,616,948
104 4,616,949
231 4,616,950
290 4,616,951
316 4,616,952
407.1 4,616,953

CLASS 404

74 4,616,954

CLASS 405

158 4,616,955
4,616,956
179 4,616,957
246 4,616,958
286 4,616,959

CLASS 406

88 4,616,960
99 4,616,961

CLASS 407

113 4,616,962
114 4,616,963

CLASS 408

144 4,616,964
204 4,616,965

CLASS 409

132 4,616,966

CLASS 411

105 4,616,967
342 4,616,968

CLASS 414

144 4,616,969
563 4,616,970
730 4,616,971
749 4,616,972

CLASS 415

2 R 4,616,973
4 4,616,974
181 4,616,975

CLASS 416

97 R 4,616,976
138 4,616,977

CLASS 417

2 4,616,978
231 4,616,979
357 4,616,980
378 4,616,981
383 4,616,982
571 4,616,983

CLASS 418

150 4,616,984
173 4,616,985

CLASS 420

117 4,617,052
530 4,617,172

CLASS 422

107 4,617,173
133 4,617,174
171 4,617,175
179 4,617,176
273 4,617,177
310 4,617,178

CLASS 423

121 4,617,179
240 4,617,180
446 4,617,181
579 4,617,182
630 4,617,183

CLASS 424

1.1 4,617,184
65 4,617,185
78 4,617,186
94 4,617,187
148 4,617,188
162 4,617,189

CLASS 425

32 4,616,986
89 4,616,987
150 4,616,988
203 4,616,989
239 4,616,990
396 4,616,991
503 4,616,992

CLASS 426

61 4,617,190
294 4,617,191

CLASS 427

38 4,617,193
42 4,617,192
54.1 4,617,194
66 4,617,195
123 4,617,196
180 4,617,197
186 4,617,198
208 4,617,199
216 4,617,200
4,617,201
253 4,617,202
294 4,617,203
304 4,617,204
305 4,617,205
374.1 4,617,206

CLASS 428

1 4,617,207
17 4,617,208
31 4,617,209
35 4,617,210
36 4,617,211
4,617,212
4,617,213
40 4,617,214
43 4,617,215
67 4,617,216
71 4,617,217
92 4,617,218
113 4,617,219
122 4,617,220
139 4,617,221
142 4,617,222
211 4,617,223
212 4,617,224
215 4,617,225
216 4,617,226
220 4,617,227
265 4,617,228
284 4,617,229
288 4,617,230
297 4,617,231
328 4,617,232
4,617,234
364 4,617,233
374 4,617,235
391 4,617,236
446 4,617,237
452 4,617,238
4,617,239
476.1 4,617,240
520 4,617,241

CLASS 429

27 4,617,242
194 4,617,243
203 4,617,244

CLASS 430

58 4,617,245
65 4,617,246
81 4,617,247
95 4,617,248
137 4,617,249
175 4,617,250
256 4,617,251
272 4,617,252
323 4,617,253
326 4,617,254
553 4,617,255
557 4,617,256
560 4,617,257
566 4,617,258
569 4,617,259

CLASS 431

41 4,616,993
347 4,616,994

CLASS 432

9 4,616,995
148 4,616,996
4,616,997

CLASS 433

73 4,616,998
225 4,616,999

CLASS 435

5 4,617,260
6 4,617,261
7 4,617,262
25 4,617,263
34 4,617,264
38 4,617,265
68 4,617,266
91 4,617,267
92 4,617,268
97 4,617,269
161 4,617,270
182 4,617,271
183 4,617,272
232 4,617,273
255 4,617,274

CLASS 436

10 4,617,275
20 4,617,276
34 4,617,277
60 4,617,278

CLASS 441

3 4,617,000

CLASS 446

48 B1 4,104,822
102 4,617,001
427 4,617,002

CLASS 464

48 4,617,003

CLASS 474

8 4,617,004
14 4,617,005
80 4,617,006
201 4,617,007

CLASS 493

248 4,617,008

CLASS 494

21 4,617,009
52 4,617,010

CLASS 501

10 4,617,279
84 4,617,280

CLASS 502

62 4,617,281
66 4,617,282
4,617,283
111 4,617,284
134 4,617,285
167 4,617,286
174 4,617,287
331 4,617,288
339 4,617,289

CLASS 514

11 4,617,290
19 4,617,291
27 4,617,292
41 4,617,293
52 4,617,294
97 4,617,295
100 4,617,296
167 4,617,297
176 4,617,298
178 4,617,299
192 4,617,300
214 4,617,301
254 4,617,302
258 4,617,303
261 4,617,304
278 4,617,305
288 4,617,306
300 4,617,307
312 4,617,308
339 4,617,309
343 4,617,310
353 4,617,311
369 4,617,312
402 4,617,313
422 4,617,314
427 4,617,315
438 4,617,316
458 4,617,317
520 4,617,318
647 4,617,319

CLASS 518

719 4,617,320

CLASS 521

38 4,617,321
60 4,617,322
4,617,323
96 4,617,324
105 4,617,325

CLASS 523

111 4,617,326
116 4,617,327
122 4,617,328
201 4,617,329
220 4,617,330
420 4,617,331

CLASS 524

4 4,617,332
96 4,617,333
177 4,617,334
265 4,617,335
291 4,617,336
399 4,617,337
437 4,617,338
514 4,617,339
588 4,617,340
591 4,617,341
606 4,617,342
817 4,617,343
837 4,617,344

CLASS 525

67 4,617,345
68 4,617,346
105 4,617,347
112 4,617,348
123 4,617,349
153 4,617,350
199 4,617,351
240 4,617,352
245 4,617,353
301 4,617,354
420 4,617,355
429 4,617,356
506 4,617,357

CLASS 526

81 4,617,358
93 4,617,359
114 4,617,360
4,617,361
209 4,617,362
253 4,617,363
263 4,617,364
265 4,617,365
272 4,617,366
273 4,617,367

CLASS 528

126 4,617,368
128 4,617,369
191 4,617,370
194 4,617,371
216 4,617,372
288 4,617,373
4,617,374
344 4,617,375

CLASS 530

308 4,617,376
317 4,617,377
324 4,617,149
351 4,617,378
388 4,617,379

CLASS 534

576 4,617,380
4,617,381
693 4,617,382

CLASS 536

2 4,617,383
27 4,617,384
98 4,617,385
122 4,617,386

CLASS 540

1 4,617,151
200 4,617,152
364 4,617,150

CLASS 544

74 4,617,387
116 4,617,388
142 4,617,389
197 4,617,390
222 4,617,391
250 4,617,392
319 4,617,393

CLASS 546

157 4,617,394
178 4,617,395
233 4,617,396
304 4,617,397

CLASS 548

112 4,617,398
152 4,617,399
317 4,617,400
453 4,617,401
455 4,617,402

CLASS 549

56 4,617,403
90 4,617,404
262 4,617,405
413 4,617,406
462 4,617,407

CLASS 556

40 4,617,408
87 4,617,409
137 4,617,410
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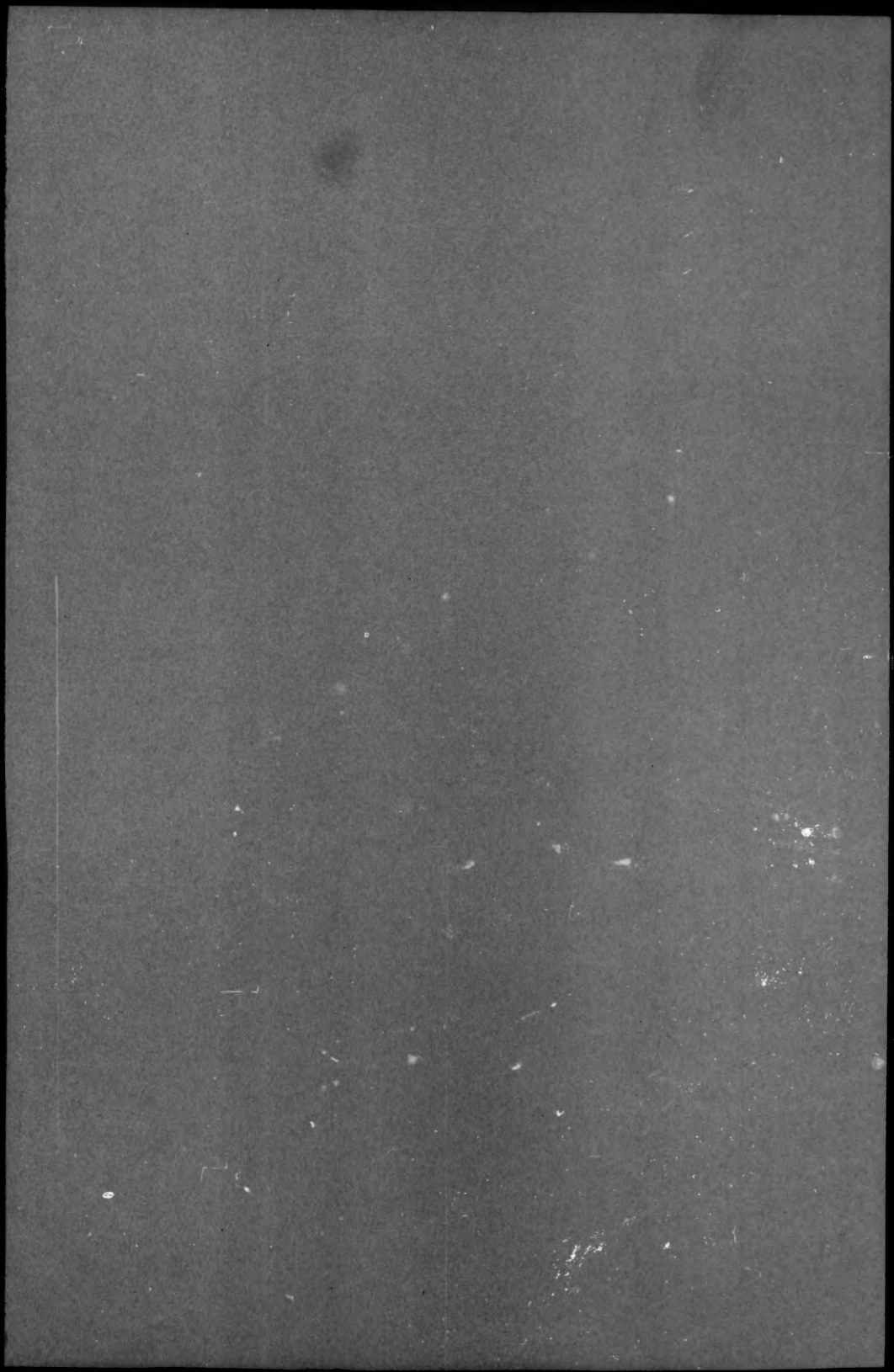

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